(16)

THE LIBRARY
OF
THE UNIVERSITY
OF CALIFORNIA
LOS ANGELES

THE WESTERN
RAJPUTANA STATES

THE WESTERN
RAJPUTANA STATES

A MEDICO-TOPOGRAPHICAL AND
GENERAL ACCOUNT OF

MARWAR
SIROHI
JAISALMIR

BY

LIEUT.-COLONEL ARCHIBALD ADAMS

I.M.S., M.D., M.Ch., F.R.I.P.H., F.R.C.S.I.

Administrative Medical Officer in Rajputana

WITH ILLUSTRATIONS

JUNIOR ARMY & NAVY STORES, Limited
YORK HOUSE, REGENT STREET
LONDON, S.W.
1899

Printed by BALLANTYNE, HANSON & Co.
At the Ballantyne Press

DS
485
K2H32

PREFACE

HAVING been officially directed to write a Medico-Topographical Account of the Western Rajputana States, I have endeavoured to lighten it for general readers by a brief history of the rulers of the country, and a reference to some of the customs and modes of thought of an interesting people, among whom I have worked for eighteen years.

Particular attention has been given to the fauna and flora of the country ; also to the legends and superstitions of the people.

My best thanks are due to the Marwar Darbar for publishing the work, and to the gentlemen who have kindly assisted me in its preparation.

JODHPORE,
3rd August 1899.

CONTENTS

		PAGE
	Introductory	1
1.	Marwar or Jodhpore State, General Description of the Country	3
	Sirohi, General Description of the Country	13
	Jaisalmir, General Description of the Country	21
	Mount Abu, General Description of	30
	Sands, Salt, Fossils, and Lime	40
	Short History of Marwar	42
	Short History of Sirohi	61
	Short History of Jaisalmir	69
	List of Residents, Western Rajputana States	74
	Capital Town of Marwar (Jodhpore), Short Description of	75
	Capital Town of Sirohi, Short Description of	86
	Capital Town of Jaisalmir, Short Description of	87
	Religions, Superstitions, and Omens	91
	Marwari Proverbs	96
	Sights worth Seeing	98
	Recreation	107
	Imperial Service Troops	109
	Mints and Currencies in the Western Rajputana States	111
II.	Public Instruction	114
	Water Supply	117
	Drainage	124
	Lighting	125
	Roads, Railways, and Tramways	126
	Slaughter-Houses	129
III.	Division of States into Parganas	130
	Principal Fairs	137
	History of Famines	143
	Disposal of the Dead	154

PAGE

IV. Markets and Food 156
Food Grains 160
Game 163
Big Game 168
Feathered Game 177
Fishes 185
Domestic Animals of the Western Rajputana States . 189
V. Preservation of Health 196
Birth-Rate in Jodhpore, Sirohi, and Jaisalmir . . 202
Diseases 207
Medical Diseases 210
Surgical Diseases 240
Sickness and Mortality 248
Epidemics 251
Medical Aid 254
Residency Surgeons, Western Rajputana States . . 265
Vaccination 266
Sanitation 277
Dispensary Towns in Jodhpore, Sirohi, and Jaisalmir . 283
Jails in Jodhpore, Sirohi, and Jaisalmir . . . 301
Insanity in Jodhpore, Sirohi, and Jaisalmir . . 307
Meteorology 310
VI. Birds 352
Insects 373
Locusts 375
Lac 388
Lepidoptera 391
Forests and Flora 397
Ferns and Flowers 423
Vegetable Gardening 426
Fruit 427
The Village and Villager 429

Books of Reference 446

Glossary 447

Index 449

LIST OF ILLUSTRATIONS

His Highness Maharaja Sardar Singh of Jodhpore	*Frontispiece*	
His Highness Maharaja Jaswant Singh, G.C.S.I., of Jodhpore	*to face page*	1
Girdikote Market and Fort, Jodhpore	,,	3
Temples, Jodhpore	,,	4
City Tanks and Fort, Jodhpore	,,	11
His Highness the Maharao Kesri Singh of Sirohi, K.C.S.I.	,,	13
His Highness the Maharawal of Jaisalmir	,,	21
Part of Palace, End of Fort, and Riding-Camels, Jaisalmir	,,	22
Dewan's House, Jaisalmir	,,	24
Dewan Council and State Servants, Jaisalmir	,,	27
Riding-Camel and Street Boys of Jaisalmir	,,	28
Villagers, Jaisalmir	,,	28
Lake, Mount Abu (showing Toad Rock)	,,	30
Mount Abu—General View	,,	32
Church, Mount Abu	,,	34
Jain Temple, Mount Abu	,,	37
Stone Carving in Jain Temple, Mount Abu—Ceiling	,,	38
His Highness Maharaja Takhat Singh of Jodhpore	,,	51
Sirohi Palace	,,	61
City Gate, Jodhpore, with Water-Carrier's Bullock and Carrying-Camel	,,	75
Temples and Dhanmandi, Jodhpore	,,	77

Temple, Jodhpore City	*to face page*	79
Fort, Jodhpore	,,	81
Palace, Jodhpore	,,	85
Street, Jaisalmir	,,	86
Fort, Jaisalmir	,,	88
Temples, Jaisalmir	,,	90
Fort and City, Jodhpore	,,	98
Temples, Jodhpore City	,,	100
Maharaja Ajit Singh's Monument or Chattri, Mandore	,,	102
Jubilee Offices and Courts, Jodhpore	,,	105
Palace, Jaisalmir	,,	106
Colonel Maharaj Sir Pratap Singh, G.C.S.I.	,,	109
Hewson Hospital, Jodhpore (*see p.* 260)	,,	110
Officers, Imperial Service Cavalry	,,	110
Balsamand Lake, Jodhpore	,,	117
Jodhpore City	,,	124
Street, Jodhpore City	,,	156
Sambher, Chiloe, Black Buck, and Red Buck	,,	163
Pig-sticking—The Kill	,,	164
Pig-sticking—The Bag, Jodhpore	,,	164
Temple, Jaisalmir	,,	166
Big Game—Tiger, Bear, Panther, and Crocodile	,,	168
Teal	,,	177
Grouse	,,	177
Partridge	,,	178
Jungle Fowl	,,	178
Bustard, Houbara, and Florican	,,	180
Snipe	,,	180
Quail	,,	182
Pochards	,,	182
Ducks and Cranes	,,	184
Fish from Banas, Abu Road	,,	184
Marwari Horse	,,	189
Sanchong Milch Cow	,,	190
Elephant Saddled for an Ordinary Occasion	,,	190

Jaswant Women's Hospital and Temple, Jodhpore *to face page* 254
Palace and Chattris . . . . . ,, 283
Mosque, Nagore . . . . . ,, 286
Dispensary, Temples, and Mosque, Merta . . ,, 286
Garden, House, and Temple . . . . . ,, 352
Old Palace, Jodhpore City . . . . . ,, 373
Butterflies, Abu . . . . . ,, 376
Locust (*Acridium succinctum*) . . . . . ,, 376
Jain Temples, Mount Abu . . . . . ,, 397
Mount Abu, with Lake and Barracks, Residency, and other Houses . . . . . ,, 423
Lake and Dispensary, Mount Abu . . . ,, 424
Maharawal, Sardars and Attendants, Jaisalmir ,, 429
Temple . . . . . ,, 430
The Nautch Musicians and Dancing-Girls, Jaisalmir . . . . . ,, 432
Jain Temple, Mount Abu . . . . . ,, 434
Garden, House, and Temple, Jaisalmir . . ,, 436
Dewan's Carriage, Jaisalmir . . . . . ,, 436
Jaisalmir Country . . . . . ,, 438
Nomadic Aborigines . . . . . ,, 440
Group . . . . . ,, 440
Monuments of Border Fight between Villagers . ,, 442
Monuments or Chattris . . . . . ,, 442

THE WESTERN RAJPUTANA STATES

INTRODUCTORY

THE Western Rajputana States comprise Marwar, Sirohi, and Jaisalmir; their respective position and area are as follows:—

MARWAR, or, as it is sometimes called, after its capital, Jodhpore, is the largest in extent of the Rajputana States. It is bounded on the north by Bikanir; on the north-east by the Shaikhawati district of Jeypore; on the east by Jeypore and Kishengarh; on the south-east by Meywar and Ajmere-Merwara; on the south by Sirohi and Palanpur; on the west by the Rann of Kutch and the Thar and Parkar districts of Sindh; and on the north-west by the State of Jaisalmir. It lies between latitude 24° 36′ and 27° 42′ N., and longitude 70° 6′ and 75° 34′ E. Its greatest length north-east and south-west is about 290 miles, and its maximum breadth 131 miles. It contains an area of 35,061 square miles. The population in 1891 was 2,528,178.

SIROHI lies between latitude 24° 22′ and 25° 16′ N., and between longitude 72° 22′ and 73° 18′ E. Its area is 1964 square miles. It is bounded on the north by Marwar; on the east by Meywar; on the south by Palanpur, Edar, and Danta; and on the west by Marwar. The population in 1891 was 190,836.

Jaisalmir lies between latitude 26° 5′ and 28° 23′ N., and between longitude 62° 29′ and 77° 15′ E. It measures 172 miles in greatest length by 136 miles in greatest breadth, and has an area of 16,062 square miles. It is bounded on the north by Bahawalpur; on the east by Bikanir and Marwar; on the south by Marwar and Sindh; and on the west by Khairpur and Sindh. Its population in 1891 was 115,701.

Girdikote Market and Fort, Jodhpore.

To face page 3.

MARWAR OR JODHPORE STATE

GENERAL DESCRIPTION OF THE COUNTRY

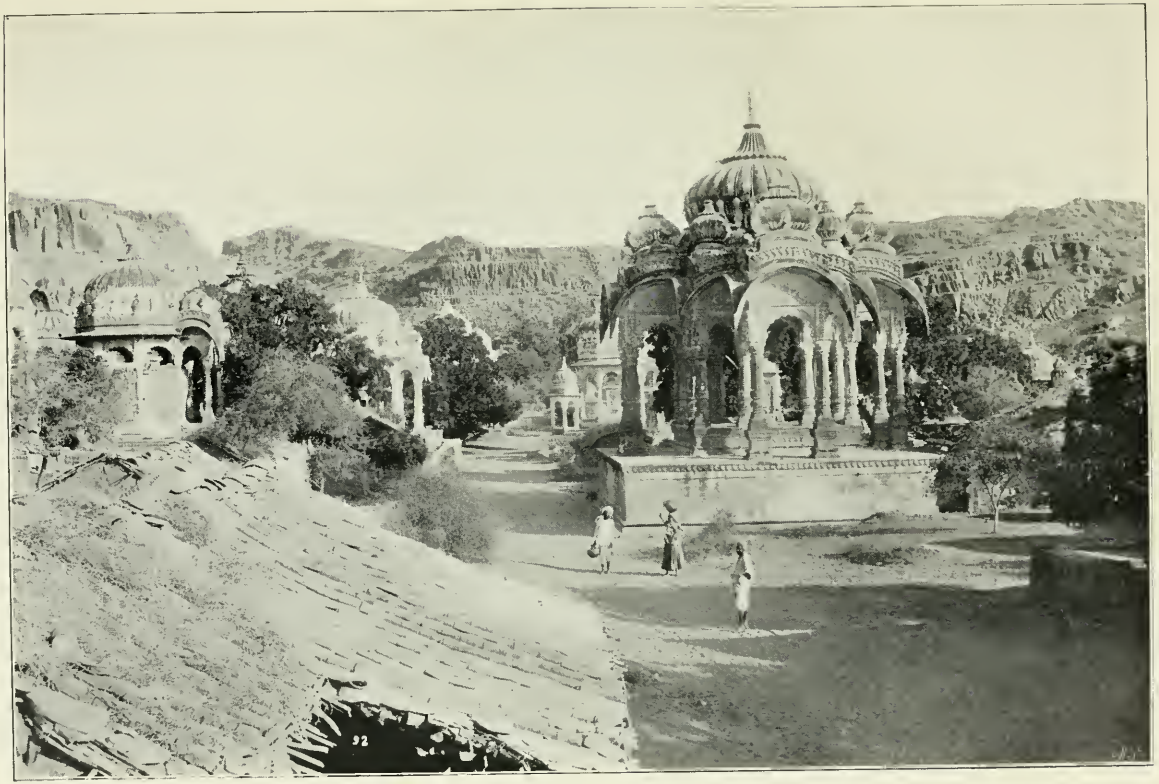
Physical Aspects.—The most marked feature in the physical aspect of Marwar is the River Luni, which flows in a south-westerly direction through the State, losing itself finally in the marshy ground at the head of the Rann of Kutch. In heavy floods it overflows its banks in the Mallani districts; the local name of this overflow is *rel*, and fine crops of wheat and barley are produced on the saturated soil. Such floods, however, are only occasional, and they make a wonderful change in the aspect of the country in the wheat season. The Luni attains its greatest breadth in the Sanchore and Mallani districts. Its water is, as a rule, saline or brackish; but when it filters into the wells, some twenty or thirty yards away from the banks of the river, it is comparatively sweet and drinkable.

The most important lake in Marwar is the famous salt lake of Sambhar, on the borders of Jodhpore and Jeypore. Three other considerable salt depressions exist in Marwar, viz., one in the N.E. at Didwana, one S.W. of Jodhpore at Pachbhadra, and one at Bhatki in the Sanchore district, near the Rann of Kutch and termination of the Luni river, which covers an area of forty or fifty miles in the rainy season, and the bed of which, when dry, yields good crops of wheat and gram. There are small depressions of less importance at Sargot, Kuchawan, Phalodi, Pohkaran, and Bilara, from which salt is easily procured.

Geology.—The geological characteristics of the country are rather complex. The south-eastern boundary, viz., that

portion of Merwara and the Aravalli range within the frontier of the State, consists principally of metamorphic or transition rocks, rising precipitously from the plains, and in some instances attaining an elevation of 3000 feet. These rocks are chiefly gneiss, hornblende, quartz, and mica-slate, with, in the higher ranges, bands of basalt and porphyry, and occasionally granite. Passing from the Aravallis to the west, the surface is sandy, with a substratum of gneiss, hornblende, quartz, and mica-slate, which here and there rise up through the sand, in some instances to a height of 800 to 1000 feet. The aspect of the country, therefore, as far as the Luni river, which divides the State into two unequal parts, is that of a sandy plain, dotted with bold and picturesque conical hills or *mers*, chief of which are those at Nadolai, Sojat, Bhadrajun, Jalore, Jasole, and Sanderao. Immediately around these hills the ground is hard and stony, but gradually passes into sand, which becomes more heavy as the eastern and northern districts are approached. After crossing the Luni, or at about one-third of the breadth of the State, these conical hills are less numerous, and sandstone appears, but the metamorphic rocks continue to occur until the range is passed on which Jodhpore, the capital city, is situated. The country to the north of Jodhpore city is one vast sandy plain or *thal*, broken by sandhills or *tebás*, which, commencing in Marwar, stretch north into Bikanir, and west and south into Jaisalmir and Sindh. In the Mallani district these *tebás* sometimes rise to 300 or 400 feet, and this part of the country resembles an undulating sea of sand. In the rainy season most of the *tebás* get fairly covered with grass and crops of *bajra*. Water is exceedingly scarce throughout the *thal* or sandy desert, and is often from 200 to 300 feet below the surface. Cases occasionally occur when it is nearer the surface, and it is sometimes even at a greater depth.

Minerals.—This part of the country is rich in salt, which is



Temples, Jodhpore.

To face page 4.

obtained in large quantities, chiefly from the natural salt lakes of Sambhar and Didwana, but also from artificial pits at Pachbhadra, and from depressions at Phalodi, Pohkaran, Bhatki, and many other places. The salt jhils of Sargot and Kuchawan possess unknown capabilities for salt manufacture, and Bilara is abundant in salt, although it is not now manufactured at these places.

The method of obtaining the salt at Sambhar, Didwana, and Phalodi is very simple, viz., by evaporation after the rainy season. The process at Pachbhadra is as follows:—Oblong pits of various sizes are dug, a supply of brine percolates through the pit bed, and when that has become sufficiently concentrated, so as to show signs of crystallisation around the pit edge, branches of a thorny shrub, called *morali*, a species of mimosa, are sunk in it. On these branches salt crystals form and continue to grow for two, or sometimes three years At the end of that period the salt crop is extracted, usually in this way: men enter the pit, and with an iron chisel, wedge-shaped, and having a handle five feet long, they cut through the thorny branches, and break up the salt which is caked on the bottom. By shaking the branches the crystals are detached. The salt thus broken up is drawn to the sides by a broad iron hoe, and is removed in baskets to the top of the pit.

Marble exists in abundance at Makrana, about twelve miles from Sambhar Lake, and also in smaller masses near Ghanerao, on the south-east border. Sandstone as well as gypsum (*khadi*) is found in abundance in many parganas.

Multani mitti, or fuller's earth, is found in considerable quantities at Kapuri; it is used by natives of all castes for washing the hair. The earth is taken for sale to Umarkote in Sindh, to Jodhpore, and Bikanir. It sells on the spot at about two annas a bullock-load.

Population.—The population of Marwar comprises the usual elements of the general Hindu community—the military

(mainly represented by the Rajputs, who are the lords of the soil), the industrial, mercantile, sacerdotal, and servile classes. The Marwaris are naturally enterprising and industrious, and are well known all over India as a singularly business-like set of men. The Rajputs are a specially manly and chivalrous class of people, who still retain the noble instincts and high ambitions of India's ancient aristocracy. The Chárans, a sacred race, hold large religious grants of land. The Bháts are by profession genealogists, but are also engaged in trade. The Minas, Baoris, and Bhils are the chief predatory classes, but are now being settled down to agriculture.

Belonging to the Chárán caste is the Darbar poet laureate, whose office is hereditary. He also keeps the records and compiles the history of each reigning chief. The present occupant, Kavi Raj Murar Dan, grandson of the great Banke Das, has given much assistance in determining some doubtful historical points.

In the sandy portion of Jodhpore and throughout Mallani the houses are mostly beehive-shaped huts, with the exception of the Thakar's and trader's residences, which, in small villages, are generally of bricks or mud, with a tiled or thatch roof. The village huts are generally enclosed within a strong fence. In advanced parganas the middle-classes dwell in houses constructed of mud, with thatch roofs, while those of Mahajans (traders) are frequently built of stone and mortar. In many villages, however, the Thakar's house is a handsome, well-constructed residence. The lower classes are generally temperate, laborious, and economical; their dress is of the most simple kind; as a rule, they partake of two meals a day, consisting of bread, vegetables, curds, and milk. Their houses usually contain nothing but a few cooking utensils and sleeping cots; carpets and rugs are rarely used, the people sitting on the bare ground. The majority of the cultivators are Jats, Sirvis, Bishnois, Patels, Rajputs, and Mahomedans of the

country, also Kaim Khanis, who enjoy grants of land, and were originally Rajputs, but forcibly converted to Islám during the Mahomedan rule.

The total population of Marwar, as enumerated in 1891, amounted to 2,528,178. The agricultural class is the predominating element, being nearly 60 per cent. of the total population. The area of the State is 35,061 square miles, and the relative density of population per square mile is 72.1. Excluding Sambhar, which belongs in part to Jeypore, and the details of which are not known, the number of occupied houses is 504,115, and that of villages and towns together 4225; the average number of persons per house is 5.02, and per village 5.36. Of the total population 89.4 per cent. are rural and 10.61 per cent. urban. Many of the cultivators live in their fields in *dhanis* or small villages of three or four houses.

By religions, the proportions per cent. are—

Hindus	86.27
Mahomedans	7.07
Jains	6.64
Aryas	.005
Christians	.002
Pársis	.001
Sikhs	.001

There were 534 male and 302 female insanes, and 5195 males and 7505 females returned as blind at last census. This blindness is greatly due to dust and glare, which aggravate outbreaks of ophthalmia and increase the tendency to glaucoma.

Of the total population, it was found at last census that—

977,803 belonged to the agricultural classes.
602,907 belonged to the professional classes.
100,032 were commercial.
725,032 were artisans and village menials.
73,492 were vagrants, minor artisans, and performers.
38,681 were miscellaneous.

The five most numerous castes in Marwar are—

Jats	.	315,443, mostly cultivators.
Rajputs	.	244,563, mostly landowners or soldiers.
Brahmins	.	211,396, mostly priests, beggars, and officials.
Mahajans	.	232,351, mostly traders.
Bhambi	.	183.082, coarse cloth makers.

Agriculture.—The principal rain crops are millets and pulses, *bajra*, *jowar*, *moth*, and *til*. In the fertile portion of the State bordering the Luni, wheat and barley are produced in large quantities, also in Godwar, Sojat, Jaitaran, and Marothe, which are among the most fertile parganas of Marwar. Cotton is largely produced. Tobacco and sugar-cane are also grown on a small scale.

The soils of Jodhpore have been classified under the following heads:—*Baikal*, the most prevalent, is a light sand, having little or no earthy admixture, and only fit for the production of *bajra*, *moth*, *til*, sesamum, water-melons, and other cucurbitaceous plants; *chikney*, a clayey fat black earth, producing chiefly wheat; *pili*, a yellow sandy clay, adapted for barley, tobacco, onions, and vegetables; *safedi*, a soil of siliceous nature, only productive after heavy rains; *khari*, alkaline earth, poisonous to all vegetation. In the sandy parts of the State the rain sinks into the soil, so that a very small rainfall suffices for crops.

Irrigation works have of late years been extensively carried out in various parts of the State. The chief of these is the Jaswant Sagar lake in Bilara pargana, constructed by Mr. Home. Its depth is 54 feet at the main bund, and it irrigates an area of 10,000 acres, on which are fifteen villages, by means of canals. Its circumference, when full, would be about twenty-one miles. It has raised the level and sweetened the water of wells on the banks of the river Luni for about a hundred miles below it. The bunds that the Darbar has constructed are in themselves wholly dependent on rains, as they are mere embankments against the rain streams, and are not fed by any

perennial river. The average rainfall is only 14 inches, which is just sufficient to produce a crop in the monsoon season, *kharif* being, therefore, the chief mainstay of the country. Although there are tanks at many villages, few of them hold water throughout the year, but many of them supply deep wells, dug in the deepest part, from which the village gets its water.

Industries.—The chief articles manufactured in the country are brass utensils, iron vessels and tools, marble vessels, gold and silver ornaments, felt rugs, camel saddles, shoes, coarse cotton and woollen fabrics for ordinary clothing, embroidered shawls, called *dawnies*, blankets, turbans, dyed and printed cloth, and *jamdanis*.

Some of the outlying and backward parganas of Mallani, Sanchore, Shergarh, Sheo, and Sankra are dependent for their industrial supplies on the more advanced parganas of Bali, Nagore, Merta, Jodhpore, and Didwana. Blankets and coarse cotton cloths are made in every district for ordinary wear.

Exports and Imports.—The principal exports are salt, from which a large portion of the revenue of the State is derived, horned cattle, sheep, goats, horses, camels, cotton, wool, dyed cloth, hides, pomegranates, marble, marble manufactures, and grinding-stones. Much of the prosperity of Marwar is due to the young Banias (dealers), born in the country, who, on attaining manhood, go all over India, and even beyond its borders, to engage in trade. These traders keep up connection with their villages in Marwar, and return from time to time in search of health, to marry their families, and to rest when they have accumulated wealth. Many of them keep up fine houses, and leave their families in their villages in Marwar, while they go great distances in search of gain; and this benefits the State enormously, as much money earned abroad is sent into the country. The bulk of the imports is paid for from this money made abroad by Marwaris engaged in outside trade.

The chief imports are *gur* (unrefined sugar) and *khánd* (refined sugar), rice, and opium. From Bombay come English piece-goods, silver and copper; from Gujerat spices, dates, gum arabic, borax, cocoa-nuts, silk, sandal-wood, and dyes. Trade is carried on chiefly by Marwari Banias in the markets at Jodhpore city, Pali, Merta, Parbatsar, Nagore, Didwana, Pachbhadra, Phalodi, Jalore, Pipar, and Balotra, the principal towns of the Jodhpore State.

Climate.—The climate is at all seasons dry, due to the position of the State, the geological nature of its soil, and the absence of forest. The Aravalli range separates the State from the more fertile districts of Oodeypore. The country is beyond the range of the full force of the south-west monsoon from the Arabian Sea, and it is also remote from the influence of the south-east monsoon from the Bay of Bengal. The clouds from the south-west, before arriving over Jodhpore, must float above extensive arid treeless districts, such as the sandy tracts of Northern Gujerat, Kutch, the Rann, and the desert districts of Umarkote and Parkar, and they are consequently very high, and generally carried away beyond Marwar by a strong monsoon breeze. This results in a very small rainfall, which, taking the centre of the country, Jodhpore, for observation, does not often exceed the average of 14 inches. In 1893 the rainfall was unusually heavy, gauging over 29.72 inches at Jodhpore city. The Luni river, except during the monsoon, contains only scanty pools of water, and its tributaries are dry during the greater part of the year. The sandy soil, the brackish water found nearly everywhere, and the prevalence of the saline efflorescence, known as *reh*, are the principal reasons why there is so little of either wild jungle growth or of cultivated ground. Thus all conditions unite in producing that extraordinary dryness characteristic of Marwar. The next most striking peculiarity of the climate is the extreme variation of temperature which occurs during the cold season between night and day.

City Tanks and Fort, Jodhpore.

To face page 11.

This depends in a great degree on the dryness of the atmosphere: the heat given off by the earth at night passes freely through dry air, whereas it is absorbed and retained by the damp particles of a moist atmosphere. Thus it happens that on the sandy soil of Jodhpore, while the nights may be sufficiently cold for ice to form, the days are often marked by a temperature of 90° F. in the shade of a tent. Similarly, although hot winds prevail with great violence in the months of April, May, and June, the nights are generally fairly cool.

During the winter months, from the middle of November to the middle of March, the climate of Jodhpore is cold and bracing, and well-suited for Europeans; at this time European children thrive well, and regain much of their complexion and vigour. The hot months are fairly healthy, but the heat becomes so intense, on account of the sandstone hills, that it is very trying, especially to European children, who should be taken away by the end of March at latest. The intensely hot wind which then blows over the desert throughout the day, and sometimes during part of the night, is extremely severe on the constitution. When, however, the sandstone hills become well cooled down by the monsoon rains, and the blowing sands steadied by moisture and sprouting vegetation, the climate is often pleasant towards the end of July, throughout August and September; but a second hot weather is not infrequent in October, and the first half of November is often unpleasantly hot.

Medical Aspects.—The prevailing diseases are malarial fevers, especially in the autumn, when the extremes of temperature are first experienced and the ground is rapidly drying after the rains. Skin affections are also very common, probably owing to bad water and indifferent food, among the lower classes, and partly from their dirty habits, due to some extent to scarcity of water. Dyspeptic diseases prevail, probably from the excessive use of *bajra* as food. Guinea-worm and

mycetoma are endemic. Of epidemics, small-pox was formerly common, but has been considerably subdued by vaccination. Cholera, however, is comparatively rare, especially in the western part of the State. Bronchitis and pneumonia are often prevalent in the cold months, on account of the extremes of temperature which exist, and the insufficient clothing of the people. Syphilis and leprosy are met with, though not very prevalent diseases,

"Bubonic plague" raged severely in Pali in 1836–37: indeed, it has for this reason acquired the name in Europe of "the Pali or Indian plague." But it was probably imported from China in silk, then extensively dyed at Pali.

Since 1896 cases of bubonic plague have from time to time been imported into Marwar and Sirohi, but the disease has fortunately not spread in the former State, and the outbreak in the latter only lasted from November 1897 till April 1898, as the infected villages were promptly vacated and the people induced to co-operate in stamping out the disease by hygienic measures.

SIROHI

GENERAL DESCRIPTION OF THE COUNTRY

Configuration.—The country is much intersected and broken up by hills and rocky ranges, which completely cover certain tracts. Its main feature is the almost isolated mountain of Abu, lying off the Aravallis, near the southern border, about twenty miles in length at the base, and separated by a narrow pass from a connecting range of lower hills, which runs in a north-easterly direction, up to within a short distance of the cantonment of Erinpura, on the northern border of the State, thus dividing the territory into two not very unequal portions. The western half being comparatively open and level, is more thickly populated and better cultivated. Both portions on each side of these ranges of hills are intersected by numerous water channels, which run with considerable force and volume during the height of the rainy season, but are dry for the greater portion of the year. The whole country, too, is dotted over with low rocky hills, for the most part covered with dense jungle, consisting principally of the smaller *dhák* tree (*Anogeissus pendula*), *bér* tree (*Zizzyphus jujuba*), a species of euphorbia (*Phyllanthus emblica*), *babúl* (*Acacia arabica*), and other mimosæ. The somewhat elevated plain west of the northern point of Abu, and the low range of hills crossing the eastern valley at Pindwára, and nearly in line with the town of Sirohi, form two lines of watersheds, from which the streams run north-west and south-west to join the Luni and the western Banás respectively. The Aravallis form a clear wall on the east, and the lower slopes of the range are covered with dense jungle.

Viewed from the top of Abu, the country shows wide tracts of low woodland, broken here and there by patches of cultivation.

Sub-surface Water.—The sub-surface water in this State is, for the most part, good, and is rarely brackish, but the depth at which water stands in the wells varies considerably. In the north-eastern portion of the State, adjoining Marwar, water is found only at a considerable depth (90 to 100 feet, and more), and is generally brackish. There are also but few wells here, and irrigation is not much practised; so that the cultivators are greatly dependent on a heavy rainfall for raising crops. In the Khuni pargana, to the north-west, the wells are of rather less depth (70 to 90 feet). In the eastern parganas, between Abu and the Aravalli range, along the course of the Banás, and in the southern parganas, the water is of good quality, and is much nearer the surface, varying from 60 to 15 feet. To the southward the wells, as a rule, are of even less depth. In the western parganas bordering Marwar, the wells are again of considerable depth (60 to 70 feet). At the town of Sirohi itself, and in its neighbourhood, water is sometimes scarce in the hot season, and it then deteriorates in quality. The depth of the wells varies from 60 to 100 feet.

Climate.—The climate of Sirohi is, on the whole, dry and healthy, and there is a general freedom from epidemic diseases, both in the hills and plains. The climate of the high hills is cool, even in the hot months, and there is much cold wind and frosty weather in January and February. Even in the plains the heat is never so intense as in the North-Western Provinces and the Punjab. But, on the other hand, the cold season is of much shorter duration, and less bracing than in the Upper Provinces, except on the high lands.

Although the climate of Sirohi is good, the hot months in the plains are severe on Europeans, and especially on European

children, who should be taken away at that season, if possible. The temperature during the rains is better suited to them, and if they do not get malarial fever, which is then somewhat prevalent, they generally thrive fairly, and the cold weather, which is pleasant although not bracing, enables them to recover their vigour and complexion to some extent.

Rainfall.—In the southern and eastern parganas there is generally a fair amount of rain, but over the rest of the district the rainfall is more often scant than otherwise. This is to be accounted for by Abu and the Aravalli mountains drawing to themselves the greater portion of the clouds as they are driven up from the sea-coast by the south-west monsoon. For instance, on Abu the average rainfall is about 64 inches, whereas at Erinpura, fifty miles distant to the north, there is only an average of about 20 inches. The prevailing wind is south-westerly in hot weather and rains, and from the north-east in the cold season.

Medical Aspects.—As regards diseases, malarial fevers are the most prevalent; dysentery and diarrhœa are met with, especially at the close of the rains and in the early part of the cold season. The jungle tracts round the base of Abu are specially malarious, but there is no known fever of an intense type answering the jungle fever of the Terai. Other prevalent diseases are pneumonia, mostly of a malarial type, rheumatism, guinea-worm, and small-pox, which is now being much mitigated by efficient vaccination. Epidemics of small-pox were formerly of very common occurrence, both at the capital and throughout the State. Cholera epidemics occur from time to time, and are frequent around the base of Mount Abu, the germs being often imported by pilgrims. Epidemic cholera has never been known on Mount Abu, and there is only one imported case on record on the hill.

Droughts and Floods.—The Sirohi district often suffers from droughts, more or less severe. The years 1746, 1785, 1812,

and 1833 are recorded as having been years of famine, and there was the late great famine of 1868–69, during which the whole of Rajputana suffered very severely. It can scarcely be said that there are ever floods in this district, but there are occasional seasons of extraordinarily heavy rainfall (such was that of 1875), when the rivers and mountain streams overflow, more or less flooding any low-lying lands, carrying away Persian wheels near the banks of streams, and causing considerable damage to the rain crops. The wheat and barley crops are occasionally damaged by frost, or by a black fungus called *giro*, which is apt to come on if cloudy weather prevails in the spring, when the crops are in ear. Locusts caused much damage to the rain crops in 1869, but they visit this State much less frequently than the deserts of Marwar and Jaisalmir.

Rivers.—The only important river in Sirohi is the Western Banás, which rises near Saimar in the Aravallis, and pursuing its course over the western declivities of the range, flows by Pindwara and along the eastern base of Abu, in a south-westerly direction. After flowing to the south-east for some distance, it resumes its south-westerly course, and then, passing the site of the once celebrated city of Chandravati, it finally passes the cantonment of Deesa, and loses itself in the sand at the head of the Rann of Kutch. Within Sirohi limits the stream is not perennial, as it usually ceases to flow about the beginning of the hot season, leaving pools of water here and there. The bed of the stream is sandy and rocky, and the banks are never high. This river, like all mountain streams, is subject to occasional flushes during the rains, but these rapidly subside, leaving the stream fordable. Near Mánpur, a little north of Chandravati, the Banás is joined by a small tributary called the Batrisa.

There are several streams in Sirohi State which contain water for many months, and, after a heavy rainy season, con-

tinue to flow nearly the whole year. Among these may be mentioned the Jawai, which rises in the Aravallis, and eventually joins the Luni; the two Sukris, which take the western drainage of the Sirohi range and flow north-west to the Luni; the Sukli or Kálerí, Nadi, and the Thára Awára, near Madár, which turns south-east and joins the Banás.

Lakes.—There are some fine bunds in Sirohi State, but none of the tanks hold much water after the monsoon ends, except the lake at Mount Abu.

Minerals.—The general character of the geological formation of the Aravalli range within Sirohi is primitive granite, with a general dip to the east, on massive compact blue slate, the latter rarely appearing much above the surface. Variegated quartz and a variety of schistose slate of varied hue are found in abundance in the internal valleys, and rocks of gneiss and syenite appear at intervals. The hilly tract known as Bhákar is made up of primitive and metamorphic rocks, schist, and limestone. Mica is found in large quantities near Gudh and Dildar. The celebrated Jain temples at Dilwára on Mount Abu are said to have been built with marble quarried from the mines at Jariwao, on the south-eastern frontier of the State.

The chief components of the numerous hilly ranges of this district consist of granite, quartz, clinkstone, and a kind of rotten slate. Limestone is also found in various parts of the district, one of the principal quarries being at Kasibál, near Sirohi.

Abu is mainly composed of greyish, large-grained granite, which often contains distinct veins of quartz, trap, greenstone, gneiss, and schist. Fragments of mica and a hard crystalline limestone are met with in different parts of the mountain. Fine specimens of rock-crystal are also occasionally found. The compact blue slate stone is principally used for flooring and roofing, as it is strong and durable. The Abu granite is much used for building purposes.

There are two marble mines on the hill, one in the lands of Achalgarh, named Vansvalla, the other at Utraj. Copper, silver, iron, sulphur, arsenic, antimony, and lead are found in small quantities in various parts of the State.

Agriculture.—There are the two usual crops in Sirohi, viz., the spring crops or *rabi*, and the rain crops or *kharif*. The principal *unali* or *rabi* crops are wheat, barley, gram, and *sarson*. The principal rain crops are Indian-corn, which is largely grown, *mong*, *moth*, *urad*, *kulath*, *guár*, cotton, *til*, *jowar*, and *bajra*. Crops are irrigated by means of the Persian wheel, called *arath* in Sirohi. The principal kinds of soil, as distinguished by the Sirohi cultivators, are—

(1) *Singam*, the soil just outside the village, which is light and rich, being manured by cattle and sheep.

(2) *Már* or *mattial*, a rather stiff, good soil, in which wheat, barley, and cotton are grown.

(3) *Bhúwr*, a rather light-brown earth, good for the rain crops.

(4) *Reti*, nearly pure sand.

(5) *Khári*, land impregnated with salts, in which nothing will grow.

Exports and Imports.—The principal exports of Sirohi are cattle, sheep, ghee, *til* or sesamum seed, honey, samber horns, sword-blades, spears and knives, also drugs, viz., *aoula* and *bahera* or myrabolams, *akroot*, *nissot*, *birami*, acacia, and other gums.

The principal imports are grain, rice, sugar, dal, spices, cocoa-nuts, tobacco, dates, English piece-goods, country cloths, silk stuffs, iron, copper, and ivory. The imports are chiefly from the Bombay side. Salt is obtained from Pachbhadra in Marwar, and opium from Malwa.

Population.—The population of Sirohi consists chiefly of Hindus, Jains, and Mussalmans, the latter bearing a very small proportion to the whole. Brahmins and religious mendicants

are numerous, and they were much fostered by Ummed Singh. Banias and Mahajans form a very numerous class, and they are mostly followers of the Jain religion. There are Rajputs of many clans, but the ruling family belongs to the Deoras, who are also the most numerous. Grasias, Minas, and Bhils, taken together, form a great portion of the inhabitants, of which Grasias are principally confined to the hilly tract in the south-east corner of the State. The Grasias were formerly great plunderers, but have now settled down to agriculture, and seldom give trouble. They are said to be the descendants of Rajputs married to Bhil women. Bhils and Minas are the principal criminal classes of this State. They are always troublesome, having a hereditary taste for strong drink, plundering, and cattle-lifting. They are naturally idle and thriftless, and have consequently never settled down to agriculture, as they dislike the steady, hard work of irrigating fields; but they cultivate rain crops, as this entails but little labour. Speaking generally, the Minas may be said to occupy the north, and the Bhils the west part of Sirohi.

There are no very wealthy classes in Sirohi. The Jagirdars are mostly poor, and generally in debt; but among the Mahajans and traders there are some rich men. The cultivators are all poor, and, as a rule, completely in the hands of the money-lenders (Bohras). The better class of inhabitants live in houses built of burnt bricks and mud, with tiled roofs. The cultivators live in mud huts, the roofs being generally tiled. The Bhils and Minas live in beehive huts, made of stakes and mud, and thatched. In villages located at the foot of hills, the huts of these classes are so situated as to allow of a ready escape to the hills in cases of emergency. In the hills the Grasias, who are the principal inhabitants, live in scattered hamlets.

Wheat and *bajra* form the chief articles of food of the better classes; barley, maize, *bajra*, *kulath*, &c., that of the poor.

The inhabitants of Sirohi generally go abroad armed, and the Bhils and Minas still carry bows and arrows, the latter caste having, in addition, a formidable dagger called *katár*.

The total population of Sirohi, as enumerated in 1891, amounted to 190,836. The area of the State is 1964 square miles, and the relative density of population per square mile is 97.2. The number of occupied houses is 42,317, and that of villages and towns together 369. The average number of persons per house is 4.42, and per village 457. Of the total population 95.4 per cent. are rural and 4.6 urban.

As regards religions and religious sects, 163,626 are returned as Hindus (which sect is the most numerous), 18,513 as Jains, and 5183 as Mahomedans.

The five most numerous castes in Sirohi are as follows:—

Mahajans	19,008
Chamárs	17,500
Rajputs	16,577
Bhils	16,238
Brahmins	13,031

Of the total population it was found at last census that

63,217 belonged to the agricultural class.
19,149 belonged to the professional class.
19,534 were commercial.
45,950 were artisans and village menials.
35,287 were vagrants, minor artisans, and performers.
4,839 were miscellaneous.

There were 50 male and 35 female insanes, 446 males and 716 females returned as blind at last census. There were only 47 lepers, of whom 35 were males and 12 females.

JAISALMIR

GENERAL DESCRIPTION OF THE COUNTRY

Configuration.—The country is mostly a sandy desert, but there are many rocky plateaus and elevated ridges, with alluvial valleys between. The country around Jaisalmir is very stony, being a continuation of the hills of Balmer, in Mallani. These extend about forty miles north of the city, with a breadth of ten or twelve miles. Fossils are found on this stony plateau; they are ammonites, belemnites, and terebratulæ, embedded in the limestone rock, which forms the greater part of the plateau on which the Jaisalmir city and fort stand. The plateau extends for a considerable distance around the city. These fossils are also sometimes found embedded in a dark ferruginous matrix of sandstone, and this variety is most common near Lodorva. Due east from Jaisalmir there is also a rocky ground, indicated by stony hills, appearing at intervals in the sand, as far as Pohkaran and Phalodi, in Marwar. Near the city the ground is very stony, with comparatively little sand and no alluvial soil. Low ridges of limestone and sandstone rock, many miles in length, rise up through the sand and form long valleys, which are fertile when rain falls, and in which grass is to be found nearly every year. In many places sandstone hills project above the surrounding country; these are often ferruginous and destitute of vegetation. The general aspect of the country, in many parts, is an interminable sea of sand-hills, of all shapes and sizes, mingled in inextricable confusion, some rising 150 feet above the general level of the country. Those in the western portion of the country are covered with

phog (*Calligonum polygonoides*), *láná*, and *khejra* (*Prosopis spicigera*) bushes; in the eastern, with large tufts of long grass. The western portion of the country, around and to the south of Shahgarh, is one of the most desolate tracts that can well be seen. In the ordinary desert, the sandhills are clothed to a certain extent with shrubs and coarse grass, and, around the villages, these afford pasture to the flocks and herds. But in this part there are large extents of shifting sands, locally termed "*dhrian*." These vary in size from two to three miles across to ten or twelve. On them there is no trace of vegetation, and their surface is ever changing, as the wind heaps the sand into hills or scoops it into deep hollows. They are very difficult to cross, the path shifting daily. The inhabitants say that they are travelling slowly northwards. They swallow up and occupy a large portion of the country, depriving the inhabitants of much of their wretched pasture-ground, and causing them to be poorer, and to have a harder struggle for life than the rest of their fellow-subjects. The people subsist chiefly on milk, with a little *bajra*, which they obtain from Sindh in exchange for sheep. The stony sections of the country are two: one would be comprised within a line drawn from Vinjorai, on the southern frontier, through the villages of Khábá, Káthori, and Mohangarh, to the border village of Chanu, north-west by north of Pohkaran, in Marwar; the second section would be between the Marwar frontier to the south-east, and a line drawn from the above-mentioned village of Chánu, in a north-eastern direction, through Nokh, to the border of the Bikanir State. The west of the State is a vast expanse of sand in innumerable waves, covered with a very scanty vegetation, and it is very thinly populated. A country could hardly present a more desolate appearance; the villages are few and far apart, and consist generally of some circular huts collected round a well of brackish water. Towards Tanot and the western portion of the country there is little of any cultivation. In the east,

Part of Palace, end of Fort, and Riding-camels, Jaisalmir.

To face page 22.

near the large villages of Nokh, Bikampur, and Barsalpur, there are many fields in the valleys formed by the sandhills, where, when the season is favourable, the inhabitants grow *jowar* and *bajra*. In several places there is a kind of sandstone and inferior limestone, which comes to the surface in the valleys. All over the country water is scarce, and generally brackish. The wells are very deep; one measured at the village of Choriá, thirty-two miles south-east of the capital, was 490 feet deep. Most of the villages have small ponds, in which the rain-water collects, in a good season sufficient to last for seven or eight months; but, as a rule, owing to the scanty rainfall, the supply fails in from four to six months. The villages have then to obtain their water from long distances (sixteen to eighteen miles). The poorer classes, who cannot afford to get their water from a distance, drink the brackish water (a well or two of which every village possesses), mixed with a little "*dahi*" (curds), the acidity of which in a measure counteracts the brackishness of the water. The average depth of wells is said to be about 250 feet. In the north-eastern portion of the country, each village has its "*tankas*," or circular holes in the ground, lined with fine polished chunam, in which water collects during the rains, and is kept for use when the other supply fails.

Scarcity of Water.—The rainfall is very scanty indeed, and water is very scarce, except at a few favoured localities. In the sandy desert water can generally be obtained if wells are dug; but in some portions of the stony desert, especially in the north-eastern corner of the State, it is so far below the surface that the springs cannot be tapped by wells, and the nature of the surface soil is such that it is extremely difficult to prevent drainage water, collected in tanks, from being absorbed by the soil. For instance, between the villages of Báp and Chanu, a distance of nearly forty miles, there is but one village at which water can be obtained during the hot season,

and during years of drought even the tank of that locality dries up, and the whole track is deserted. The excavation of a well was attempted in this part of the State; it was dug to a depth of nearly 500 feet without tapping the springs, and was at last abandoned in despair when a stratum of sand was reached. It may be imagined that, in such a country, salinity of soil would be rare, and, in fact, tracts of salt are only met with at the two oases, where depressions occur, and water is near the surface.

Soils.—Almost the whole of the soil of Jaisalmir may be described as sandy. It is favourable to some grains, notably to *bajra*, of which good crops are sometimes grown. The capital of Jaisalmir is built on a hill, which furnishes a limestone more valuable than even the red sandstone of Marwar; it is of a dull yellow colour, takes a fair polish, and is good for lithograph blocks. There is another variety of yellow limestone, with large quantities of an iron substance, like red ochre, blended with it, produced at Hábur, a few miles from Jaisalmir, and there are extensive pits of a yellow unctuous clay, resembling Fuller's earth or *Multani mitti*, which is largely exported, and used as soap for washing the hair.

Minerals.—Yellow marble of excellent quality, easily polished and carved, is met with at Jaisalmir. The plateau on which the capital stands is principally composed of this yellow marble; it is very extensive, and from it most of the building-stone used for carving and roofing is now taken. This stone is also largely exported. In Khuiala pargana, at Habúr village, thirty miles from Jaisalmir city, a marble is obtainable which is considered sacred, and is used in flooring temples. Sandstone of good quality is obtainable from the plateau, also from Bhadasar and many other places in the State. The Bhadasar sandstone is hard, and used for making grinding-stones. Carbonate of lime, in the form of *kankar*, is common throughout the country, although deeply embedded in sand in

Dewan's House, Jaisalmir.

To face page 24

many places. Sulphate of lime is met with twelve miles from the city. It is probable that coal is to be found in Báp district, and that the seam recently discovered in Bikanir runs into Jaisalmir. There is also iron, and lignite in some places, in small quantities. There are four quarries of Fuller's earth in Jaisalmir, viz., at Mandhu, Nedi, Ramgarh, and Mandai, from which exports take place.

Salt of fair quality is found in abundance in four parganas, viz., Jaisalmir, Dewa, Nokh, and Báp on the Phalodi border. It is, however, manufactured at Kanode only, and is not exported, as the Marwar salt is of superior quality, more easily manufactured, and conveniently located for exportation.

Climate and Rainfall.—The climate of Jaisalmir is essentially dry, bracing, and healthy, akin to that of the north-west of Marwar. As regards temperature, the heat is greatest in the months of May and June, when hot winds prevail with much violence. The temperature generally ranges between 64° and 115° F. As soon as rain falls, the weather becomes cool and pleasant; the coldest times are from the middle of December to the middle of February, when the thermometer falls very low, with a good deal of frost and ice. In January the thermometer always reads below freezing-point during the night.

During the few cold months the climate of Jaisalmir is both bracing and invigorating, and ideal for Europeans. The sky is then clear, the thermometer low, and the air crisp and stimulating; consequently unusual exertions can be made without fatigue, and sound sleep enjoyed throughout the night. The hot weather is very prolonged, and the heat very intense and trying to the constitution of Europeans. Then there are years when the rainfall is so light that it is insufficient to cool the country much, even for a short time. However, when the rainfall is good, there are two or three months of pleasant weather during the monsoon season.

The rainfall was very scanty in 1898, viz., 3 inches

87 cents. The monsoon consisted of a few days of light showers, which barely wet the ground, and put very little into the tank. The average rainfall for the twelve years ending 1898 was 7.34 inches, and this includes an unusual rainfall, namely, that of 1893, in which 15.24 inches were registered.

General Character of the People.—Notwithstanding the many difficulties of existence in this barren country, the Jaisalmir people always seem bright and happy; even scarcity of water and food in bad years does not seem sufficient to depress their buoyant spirits. They are naturally hardy and healthy, take life easy, and labour very little. The soil is so unproductive and the seasons so capricious, that they can never rely on their sowings being followed by a harvest; so they depend more on their flocks and herds to supply them with the necessities of life than on agriculture.

General Character of the Country and the Soil.—The country shows signs of a greater population than there is at present, and there are many deserted villages to be seen throughout the districts, with substantially built stone houses, some of which exhibit considerable carving and ornamentation. These villages were occupied by Palliwal Brahmins, who left the country about a hundred years ago on account of the oppression of Sálem Singh, the then minister. Many of the houses would now require very little repairs to make them habitable, so substantially were they built in the prosperous age of the country. These Brahmins were excellent cultivators, and it is said that all the long valleys between the stony ridges and sandhills were then cultivated, and that the country teemed with wheat and other grains grown by them. They made dams across these valleys to prevent the rain from running off, and in this way improved the fertility of these depressions, locally called "*khárins.*" Some of these *khárins* are still cultivated, but many of them only produce grass, and the dams have mostly disappeared from want of care. Some of them are now being

Dewan Council and State Servants, Jaisalmir. *To face page* 27.

repaired, but there is no population to restore to the Jaisalmir State its original prosperity, and the monsoon is supposed, by many of the inhabitants, also to be less favourable to this than formerly.

Medical Aspects.—Epidemics are of rare occurrence. People suffer chiefly from mild malarial fever, pneumonia, and bronchitis, on account of scanty clothing; skin diseases, guinea-worm, and small-pox. There is a saying that "neither mud, mosquitoes, nor malaria is to be found in these regions," and malarial fevers are neither so common nor so severe as in other parts of India. Small-pox, the great scourge of the juvenile population, is being mitigated by vaccination, and the germs of cholera and plague have never yet been able to survive the hardships of the desert; so these diseases are still unknown in Jaisalmir.

Rivers and Lakes.—There are no perennial streams in Jaisalmir, but two small rivers, one called the Láthi-ka-Nádi, flow through the State during the monsoon rains. The former rises in low ground belonging to the villages of Kotri, Gohira, and Latabáná, and after flowing a distance of twenty-eight miles, spreads over a large space of flat ground, and forms a lake called the Bhuj Jhil. In years of exceptionally heavy rainfall this river often deviates from its usual course, and forms a rinn or salt lake, extending to a distance of fourteen or fifteen miles beyond Bhuj.

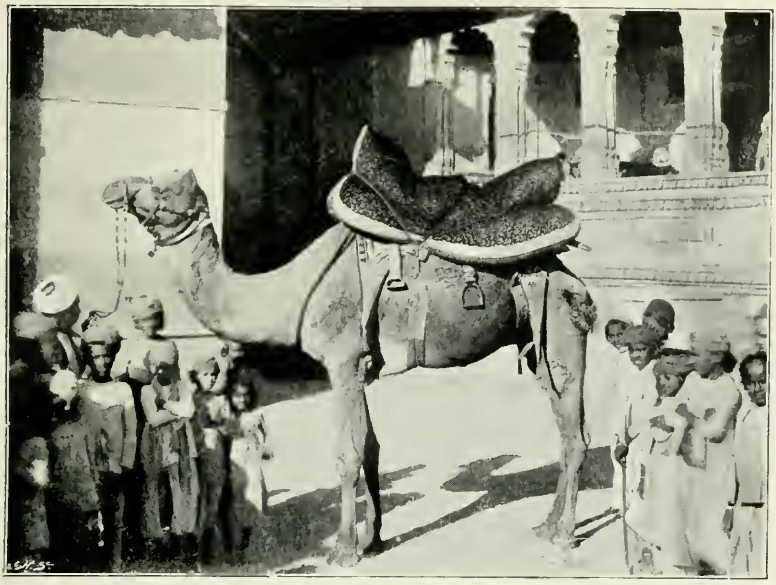
The Láthi-ka-Nádi flows in from Marwar, divides itself into two branches, which again unite about eight miles to the east of Lathi, and takes a western course for about twenty-four miles, where it forms a lake near the village of Mohangarh, which sometimes covers an area of twenty or thirty miles. These lakes become rapidly reduced by leakage and evaporation after the rains, and wheat is then grown over the greater part of the depressions; but there is sufficient rainfall for this only once in ten or twenty years.

Agriculture.—Rain crops, such as *bajra*, *moth*, *til*, &c., are chiefly grown. The soil being light and sandy, good crops of *bajra* are produced after a very slight fall of rain. Crops of wheat and barley are rare, but they are grown in favourable seasons in the depressions around tanks, and in other valleys locally known as "*kharins*."

In the sandy parts of Jaisalmir the rain sinks into the soil, and does not flow off the surface, so that a very small rainfall suffices for good crops of *bajra* and *moth*. The produce of the country, in a favourable season, is more than sufficient for the immediate wants of the people, and hoards are then made; but storage is unfortunately difficult, as the burnt earthen vessels, necessary to keep the grain in good condition for a length of time, have to be brought from long distances. The *karbi* or *bajra* stalks, which make excellent food for cattle, are little heeded in good years, when rich grass is plentiful, and little of either *karbi* or grass is cut and stacked to stand against bad seasons. Consequently many of the advantages of a bumper year are lost by the careless habits of the people.

When wheat or grain is grown, the Darbar's share from the cultivators is from a fourth to a sixth, and of the rain crops, such as *bajra*, *moth*, *til*, &c., from a seventh to an eleventh of the produce. These heavy dues in kind have anything but a stimulating effect on agriculture in a country so subject to the caprices of the monsoon. Consequently the people rely greatly on their herds and flocks for maintenance, and many of them on a few months' labour every year with the Zemindars, who cultivate the fertile banks of the Indus.

Population.—The total population of Jaisalmir, as enumerated in 1891, was 115,701, with a density of 7.2 per square mile, as compared with 108,143, with a density of 6.7, in 1881. The area of the State is 16,062 square miles. Of the total population, 91 per cent. are rural and 9 per cent. urban.



Riding-camel and Street Boys of Jaisalmir.

Villagers, Jaisalmir.

To face page 28.

The most numerous castes in Jaisalmir are :—

Rajputs	28,329
Bhambis	7,555
Chamárs	7,976
Mahájans	6,762

The following clans of Rajputs are represented in Jaisalmir :—Bháti, to which the ruling family of the country belongs ; Rathore, Kachawah, Chohán, and Shishodia. The different kinds of Brahmins are Pushkarná, Srimali, Joshi, and Palliwal. The last-mentioned caste were much more numerous before the time of Dewan Salem Singh, under whose tyranny they suffered much, and many of them left the State on that account ; they were good cultivators, and Jaisalmir has sustained a great loss in them.

GENERAL DESCRIPTION OF MOUNT ABU

Mount Abu is a detached hill of the Aravalli range, somewhat south-east of the centre of the Sirohi State; it is separated from this range by a valley about fifteen miles wide; it is principally solid granite, in many places well covered with soil, and well wooded, especially its valleys and watered slopes. The shape of the mountain is long and narrow, being about fourteen miles in length by two to four miles in breadth on the top. The base is about twenty miles in length by eight miles in breadth at its widest part. The direction of the hill is from south-west to north-east. Its principal peak, Guru Sikhar, towards the north end, is the highest in Rajputana, being 5653 feet above the level of the sea. The station of Mount Abu is about 4000 feet above sea-level; it is built on an irregular plateau, surrounded by several projecting peaks and elevated ridges, topped by huge boulders, some of which present very fanciful shapes. Among these are the "Nun" and "Toad" rocks, which present, on a very large scale, a remarkable resemblance to a nun and a toad. The Nun rock was struck by lightning in 1890, and a piece of stone, resembling a long straight nose, detached. There is still, however, much resemblance to a nun in the stone taken *tout ensemble.*

Uria, another considerable plateau, is about five miles from Abu station; it is 500 feet higher than Abu, and lies below the main peak of Guru Sikhar, and somewhat south of that elevation. This plateau is surrounded by low ridges. It con-

Lake, Mount Abu (showing Toad Rock). *To face page* 30.

tains three small tanks, which hold water a great part of the year, and has some good wells close to the villages on it. It is cooler than Abu, and would be a good site for a sanitarium if sufficient water could be assured.

Lakes and Tanks.—The Nakhi Talao or Abu Lake is situated close to the station, on the west side of the bazaar; it is about half a mile long by a quarter of a mile broad. It is very shallow on the east side towards the bazaar, but is twenty to thirty feet deep towards the dam on the west. Although this lake has, according to the local legend, been excavated by the nails of saints (whence its name), there is little doubt of its being of volcanic origin; but it has been considerably deepened and enlarged by a dam on the Anadra side. It is most picturesquely situated between high hills with projecting peaks. The slopes and ravines adjacent are well wooded, especially on the south and west, and there are several rocky islands in the lake, which add greatly to the picturesque beauty of the scene. Some of them are partially covered with bushes and grass. There is an overflow from the lake for a considerable time after the monsoon season, but this generally ceases before the end of the hot weather, and the water level sinks considerably below the top of the bund before the rains set in to again replenish it.

The water of the Abu Lake is not potable, and even the wells in its vicinity, at certain seasons when it is low, or when the decay of vegetable matter around its edges is at its height, smell heavily, are full of organic matter, and unpleasant to the taste, which is not the case with most of the station wells at a distance. This lake is held sacred by Hindus, who perform pilgrimages by walking round it, by drinking from it, and by washing in it. Occasionally individuals weary of life, from some incurable disease or from some other cause, resort to it for suicide, in the hope of immediate transportation to a better land, where they would be free from their malady.

A large tank is being completed by the Sirohi Darbar above the Dilwara temples, about a mile and a half from Abu, which will hold about 50,000,000 gallons of water. This will be collected from high ground, and be of much superior quality to that of the lake. It is proposed to distribute this water to the station by pipes, and it is hoped it will completely remedy the scarcity which takes place every year during the crowded season, when the best wells become low, and restrictions have to be put on the quantity drawn from them.

During the monsoon season the edges of the lake are surrounded by green grass and weeds, and there is very little marshy ground even in the wettest weather. Nevertheless, the houses in its vicinity are more malarious than in other parts of the station, and boating on it, or walking too frequently by its edges, after the rains have stopped, has been considered sufficient to account for severe attacks of malarial fever. During the hot weather, when the water level of the lake has generally fallen considerably, and when its shores are dry and free from rank vegetation, the same unhealthiness does not seem to exist, and the roads and paths about it are then very favoured resorts for those in search of fresh air and exercise.

Climate and Rainfall.—The climate of Abu, for the greater portion of the year, is very agreeable and healthy. The seasons do not differ in time from those usually experienced in the plains, except that the temperature is always 10 to 20 degrees lower.

During the hot season, which commences about the middle of April, the midday temperature is at times unpleasantly high, especially after seasons of insufficient rainfall, when it sometimes rises to 96° or 97° F. in the shade, and on one or two occasions it reached 100° F.; which is, however, very unusual. The thermometer seldom exceeds 90° or 94° in the hottest days, and owing to the dryness and lightness of the atmosphere, and to the absence of hot winds, the heat at this

Mount Abu—General View.

To face page 32.

period of the year is not generally trying to the constitution of Europeans. Punkhas are seldom used, the doors of houses are kept open, and the constant south-west breeze, which crosses the desert as a hot wind, becomes cool by the rapid expansion of the air as it ascends the hill, and this moderates the temperature, which would otherwise doubtless be intense on the rocky surface of Abu in summer. The nights and mornings are almost invariably cool, fresh, and invigorating.

During the rainy season the temperature is always pleasant, but the air is then damp, and fires are required in the houses to keep them dry. During December, January, and February, frosty nights are frequent, and a cold north-east wind generally blows over the hill at that season. From the middle of October to the end of November there is sometimes a good deal of malarial fever, especially among the natives, who are badly housed and badly clothed. Years of light rainfall are, as in the plains, less feverish than years of a heavy monsoon. It is my experience that a heavy downpour of rain at the beginning of the monsoon, which washes the hill thoroughly before everything becomes welded to the surface by the rapid growth of vegetation which takes place after the soil becomes moistened, lessens the fever of the season; the early appearance of frost has also a good effect in this direction.

Hardly any season passes without cases of enteric fever among the Europeans in Abu, and it is not uncommon among the natives, especially children. Soldiers, convalescent from the disease, come up the hill in early spring and carry the germs of enteric into the sanitarium and station.

It is supposed that the temperature on Abu has increased since the hill was first occupied as a sanitarium, owing to the reckless way in which many of the peaks have been cleared of timber, and the consequent drying up of several springs and streams at an early time of the year. Forest regulations have

been in force for the last five years, and the destruction of the best timber is now prevented.

The time at which the rains set in varies; they usually commence, with thunderstorms, about the middle of June, and there are generally passing showers in the last week of May.

The rainy season, as in all hill stations, is rendered somewhat unpleasant by the prevalence of fog and drizzle, and the intense moisture of the atmosphere. But the temperature is cool and pleasant, and there is none of the stifling damp heat of the plains; the climate, too, is healthy at this season. The rainfall is generally heavy, but not excessive, and varies greatly from year to year. The average during the last twelve years has been 66.28 inches, but there have been years of unusual rainfall, such as 1862, in which 123, and 1893, in which 130 inches were registered; again, in 1868, 31, and in 1898, 36 inches only were recorded. In 1893, 201 inches were registered at the Railway School, where the rainfall is generally much greater than in the station. However, only 46 inches were registered there during 1898. The average fall of June is about 8 inches, of July about 25 inches, of August about 20 inches, and of September about 10 inches. The monsoon rains usually cease, as they begin, with thunderstorms, about the middle of September, after which, for a few weeks, an occasional shower falls, and there are generally a few heavy showers during the cold weather about Christmas.

A short interval of warmer weather follows the monsoon, and during the period of the drying-up of the rains there is a good deal of malarial fever, especially among the natives; but the disease is not often of a very severe type. From the middle of October to the middle of November is generally the most unhealthy time of the year.

During the cold season, from December to March, the climate is very healthy and bracing, and fires are required in the houses; but the cold is not excessive, as the temperature

Church, Mount Abu. *To face page* 34.

seldom falls below 40°, and the average is 60°. Hoar-frost often covers the ground, sometimes remaining in the shade till nearly noon, and then ice forms on any still water. On the whole, Abu may be considered as possessing a very good climate, combined with the advantage of beautiful scenery. European children located on Mount Abu keep in good health at all seasons. They maintain their vigour and retain much of their bright complexion.

Sanitation.—The sanitary arrangements of Mount Abu are well directed by the Magistrate, advised by the Local Municipal Committee and the Residency Surgeon, Western Rajputana States. Much attention is given to drainage, conservancy, and the prevention of over-crowding, to which there is a great tendency in the hot weather.

The town of Kerari, at Abu Road, has recently been well drained by the Sirohi Darbar, and great attention is now given to conservancy there.

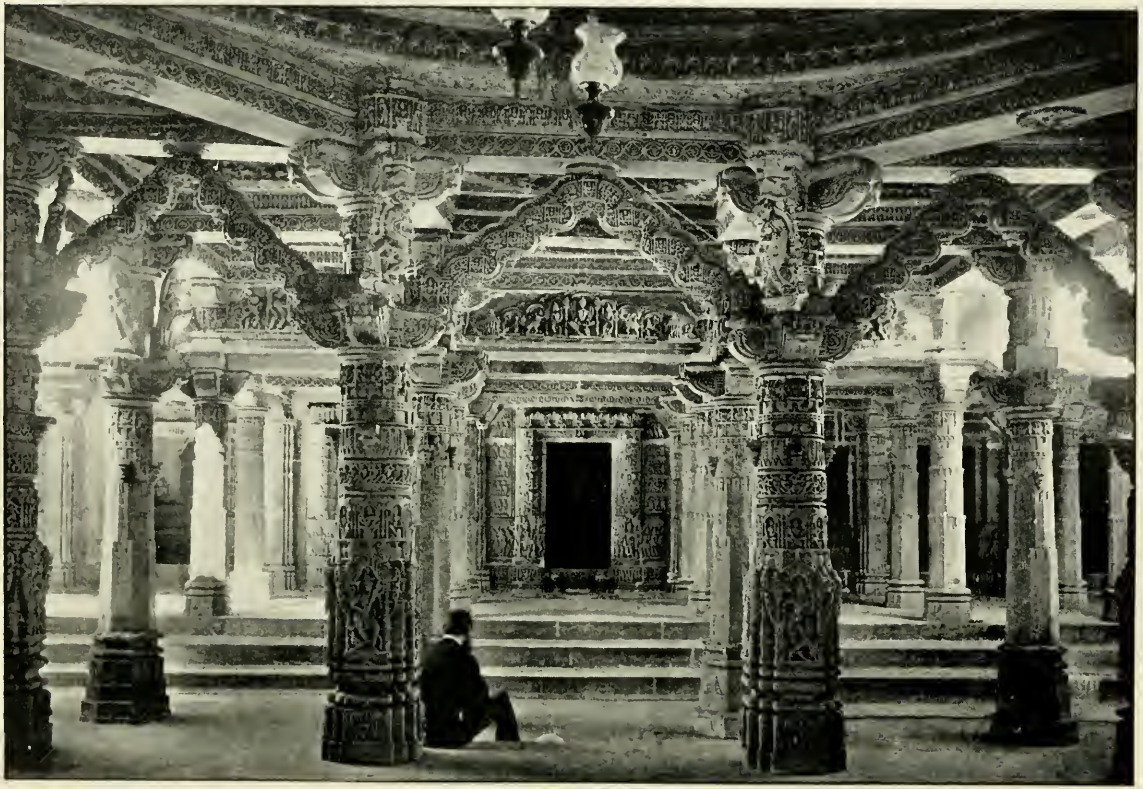
Water Supply.—Considering the hilly nature of the surface on the summit of Abu, perennial springs of water are singularly few and small. This is doubtless owing to the generally impervious nature of the rock preventing deep percolation. But, for the same reason, water can be got in almost every valley, within twenty or thirty feet of the surface, by sinking wells through the clay. Many of the basins retaining these collections of water are small and shallow, so that the supply is soon exhausted, and towards the end of the dry season the wells in them cease to yield much; those situated lowest in the valleys nearest the deepest part of the basin lasting longest, and always giving the most. The water in all these wells, although uncertain as to quantity, is of good quality.

Earthquakes.—Earthquakes are very frequent at Abu at uncertain intervals. The shocks are generally very slight, and have an undulatory motion, but are accompanied with much rumbling noise. From information derived from local

sages, there appears to have been a severe shock in Sambat, 1881 or 1882 (A.D. 1825 or 1826), which caused damage to houses, and cracked some of the arches of the Dilwara temples; also a somewhat severe earthquake in 1849 or 1850. Again, in 1875 there was a considerable shock, accompanied by a very loud and alarming noise. This shock was felt at Jodhpore, about 150 miles away. From these instances it would seem that the more severe shocks occur at intervals of about twenty-five years. The great earthquake of June 1897, which did so much damage in Calcutta, Assam, and other parts of India, was hardly perceptible in Abu. No year passes without earthquakes of some sort on Mount Abu, but they are generally nothing more than a slight underground rumbling. The legend is that holy Abu rests on the horns of a great bull, and that when he is displeased by the sins of the people, he shakes his head, thereby producing an earthquake. The importation of beef is said to be always followed by an earthquake. Beef is forbidden on the hill by treaty, but is sometimes smuggled in by cooks.

Epidemics.—It is remarkable that Abu, notwithstanding the great flow of pilgrims, is unusually free from epidemic disease. Cholera is almost unknown on the hill, only one imported case having been seen there within the memory of the oldest inhabitant. Plague found its way to the foot of the hill, but fortunately it was intercepted there. Small-pox alone, of this group, makes occasional ravages among the aborigines, who manage to evade vaccination. Typhoid fever is frequently seen, both among Europeans and natives, and this is only what might be expected, as many of the young soldiers are barely convalescent from the disease when they are sent up the hill for change.

Civil and Military Station.—Abu is the head-quarters of the Local Government of Rajputana, and the principal sanitarium for the British troops of the Bombay command. The



Jain Temple, Mount Abu.

To face page 37.

Lawrence School for soldiers' children, and Railway School for children of Railway employés and others, are located on the hill. Abu is also the summer head-quarters of the Western Rajputana States Residency, and several of the chiefs of Rajputana reside on the hill during the hot months. Abu sanitarium includes barracks for about 150 troops, quarters for women and children, and a station hospital; also houses and quarters for ten or twelve officers. Invalid and convalescent soldiers come up the hill early in March, and many of them get permission to return to their regiments in the plains in July, as they dislike the damp of the monsoon season; others only go down at the beginning of the cold weather, or in time to catch the home transports.

Population.—The population varies very much, according to the season of the year. From the middle of March to the middle of July the season is at its height. There are sometimes about 400 to 500 Europeans on the hill—officers, their families, soldiers, and children—and the native population is at this time greatly increased by the influx of servants, tradespeople, and workpeople. During the rains the population diminishes, but it again increases towards the end of September, when the second season begins. From November to March the population is at its lowest; even the bazaar is then somewhat deserted; and the school children take their holidays about Christmas, so this further depletes the winter population.

There are several small villages on Abu inhabited by Rajputs, Bhils, Brahmins, and Banias; the latter are principally residents of the Abu bazaar, where they are mostly connected with the supply trade of the hill.

Temples and Shrines.—There are many temples and shrines on Mount Abu, and these attract a continuous stream of pilgrims from various parts of India. The Jain temples at Dilwara—a small village outside the Abu station—are the

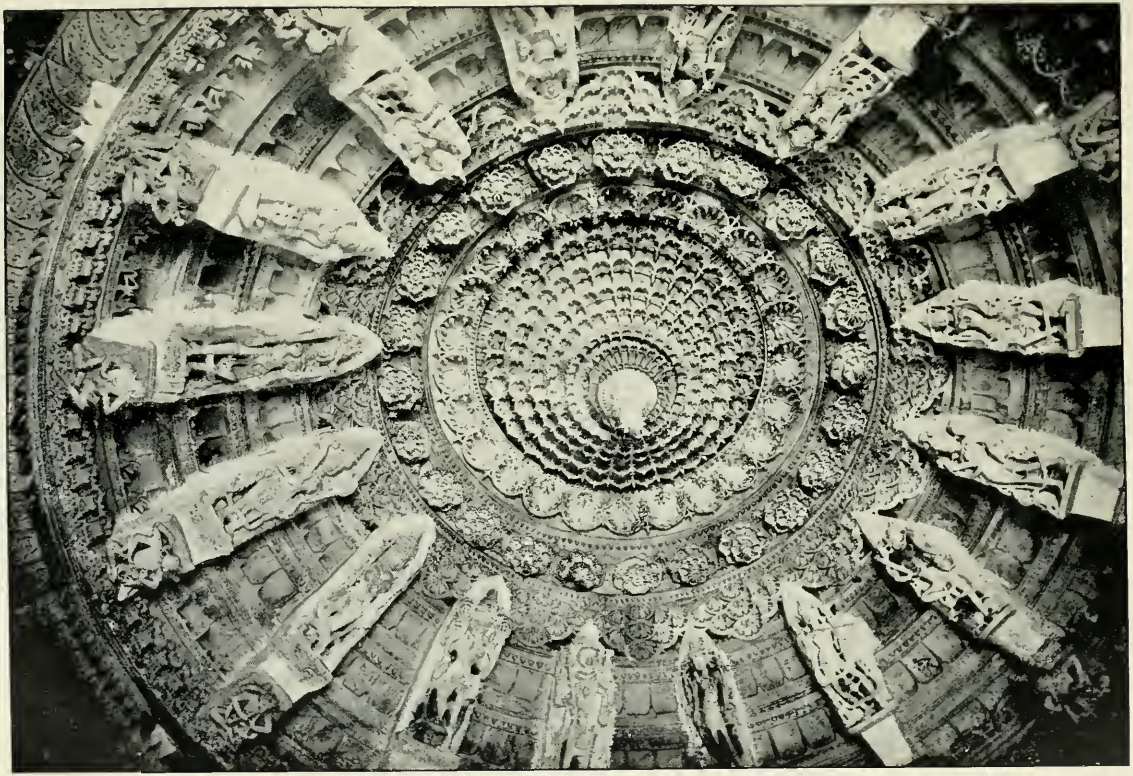
most celebrated. They are about 700 years old, and two of them have beautifully carved ceilings and columns. They are visited by many hundreds of Jains annually, and Abu is one of the four principal places of pilgrimage of this sect. Gau Mukh, Guru Sikhar, Achalgarh, Achleswar, and the shrine of Adhar Devi are all regularly frequented by batches of pilgrims, which come and go throughout the year.

Roads.—There is now a good metalled road from Abu Road Station to Mount Abu, 17 miles in length, and on the other side of the hill there is a zigzag path connecting the station with the old Ahmedabad-Ajmere highway. There is a good road from Abu to Uria, which passes the Dilwara temples. All these roads have been much improved during recent years. There are also made paths to all the important shrines and objects of interest on Mount Abu.

Recreation.—There are a good polo ground, racket, tennis, and badminton courts, a cricket ground, a racecourse, and a golf links on the hills. Visitors to Mount Abu are much indebted to the local chief, and to some of the other liberal chiefs of Rajputana, who have contributed largely to the funds from which these pleasure grounds have been made out of hard and rugged upheavals, that almost defied dynamite.

Fairs.—There are no fairs of any importance held on Abu, but great bands of pilgrims, called "Sangs"—mostly Jains and Vishnus from parts of India—frequent the hill. On these occasions the Dilwara and other Jain temples on Abu benefit largely from the pilgrims' donations, and, owing to the sanctity of the hill and the number of shrines and temples on it, pilgrims are always coming and going; but a special pilgrimage, called "Singat," occurs every twelfth year, when thousands of people throng the hill. A pilgrim-tax is levied by the Darbar of Sirohi on Mahajans, Sunars, and Kalals of all districts who come from places outside Sirohi.

Medical Institutions.—There is a hospital for the Rajputana



Stone Carving in Jain Temples, Mount Abu—Ceiling.

To face page 38

Agency Staff and the Agent Governor-General's escort, and a charitable dispensary for the poor, on Mount Abu; and there is a second charitable dispensary at Abu Road Station. The charitable institutions are partly supported by private subscriptions, collected by the Residency Surgeon, Western Rajputana States, from residents and visitors on Mount Abu during the season. Government gives medicines and hospital assistants free, and the Sirohi Darbar provides the dispensary house at Abu Road free of rent.

In 1897, 31 in-patients and 4632 out-patients were treated in the Abu Charitable Dispensary, and 10 major and 134 minor operations performed in it.

In the Abu Road Dispensary, 71 in-patients and 16,999 out-patients were treated, and 48 major and 619 minor operations performed in 1897.

As the population of Abu and Abu Road bazaars is principally engaged in the food supply of Mount Abu, most of the attendance at these institutions is in the summer months, there being fewer people resident in the cold weather.

SANDS, SALT, FOSSILS, AND LIME

THERE is no doubt in the minds of scientific men regarding the sands of Jaisalmir, that they must have been left there by the rolling ocean, of which there are still many well-marked indications imprinted on the country. Moreover, sea-shells, fossil terebratula, and other fossilised marine invertebrata, can be readily picked out of the sandstone rocks or collected from the ground, which sets the question beyond dispute. It is, however, different with Marwar, and there are but few traces of the sea, which could not have come much beyond the mouth of the Luni, before it is lost in the Rann of Kutch. Mr. T. La Touche, of the Geological Survey, is of opinion that the sands of Marwar have been mostly blown up from Kathiawar, by the steady south-west wind, during countless ages, and that this has been supplemented by grains of sand worn off the rocks by the same prevailing wind. The sands of Marwar contain fossils of extinct foraminifera, which are found in abundance in the sands of Kathiawar, and the grains of this sand are sharper and have less rounded ends than those of sea-sand, which become blunted by being rolled together. The calcified protozoa, or fossil foraminifera, account for the abundance of carbonate of lime in the form of *kankar*, which is found in the subsoil of Marwar. The monsoon rains dissolve out the lime of these minute shells; it filters through the sand in solution, and as evaporation takes place in the dry season, the lime is deposited below, and *kankar* is thus formed. When sandhills grow to a certain height, their bases become stationary, but their tops are blown forward from time to time

and re-formed by the sand brought up from behind; this continues indefinitely.

The salt, manufactured at Pachbhadra and other places, by digging pits in the sand and allowing crystallisation to take place under evaporation, is dissolved out and washed down from the hills during the monsoon season. The solution percolates slowly through the sands, and by evaporation during the dry season the chloride of sodium is eventually deposited in the soil, where it remains until it is collected in the above way.

SHORT HISTORY OF MARWAR

THE EARLIER RAJPUT PERIOD

The ruling family of Marwar are Rathores, of the Surajwansh or Sun family, and claim their descent from Kush, the second son of Rama, the celebrated king of Ajodhya. The word "Rathore" is said to be derived from "Rashtwar," which means "blessed of Rashtar Sena," the falcon of the world, which was the insignia adopted by Mansá Devi, the family goddess of the rulers of Marwar.

Kanauj is said to have been conquered by Nenpal of the Rathore clan in 470 A.D. He was succeeded by Bharat, who had thirteen sons, from whom sprang many branches of the Rathore clan. They ruled here for seven hundred years, and formed one of the four great Rajput kingdoms among whom India was divided at the time of the first Mahomedan invasion. Kanauj was situated on the Káli Nadi. In its prosperous days it was a very large town, having a circumference of thirty miles. Jai Chand, the last king of Kanauj, picked a bitter quarrel with Prithvi Ráj Chohán, his cousin, and the last of the Hindu kings of Delhi. He called on Shahabuddin Ghori for help, with whose aid the Delhi king was defeated, taken prisoner, and eventually killed. The Mahomedan conqueror then led his army against the city of Kanauj and besieged its fortress. Jai Chand and his men fought very bravely, but were severely defeated; and thus both the great Hindu kingdoms of Delhi and Kanauj were brought to ruin in 1193 A.D.

Siaji and Saitramji, the two grandsons of Jai Chand, roamed about as outlaws against the Mahomedan rule for

eighteen years, till at last, in 1211, they left their mother-country with only two hundred followers, and proceeded on a pilgrimage to the holy shrine of Dwárká, where they slew Lákhá Phuláni, a notorious robber. Saitramji was killed, but Siaji continued his march into Marwar, and conquered Mehwo and other districts, till he reached Pali, then held by Palliwál Brahmins, who were constantly harassed by Mairs and Minás. Against them the Brahmins sought the assistance of the brave Siaji, who, with his followers, succeeded in putting to the sword a large number of the Mair and Mina freebooters. On the entreaties of these Brahmins, Siaji agreed to settle among them as their protector. Shortly after, at the instance of a Solankhi wife, he destroyed these Brahmin Jagirdars and became master of Pali. From that date he assumed the title of Rao, and made Pali the principal seat of his government. His son and successor, Asthanji, conquered the land of Kher from the Gohil Rajputs, while Sonig, the younger brother of Asthanji, took Edar.

Chonda, tenth in descent from Siaji, and successor to Rao Beeramji, conquered Mandore from Parihár Rajputs in 1395; the seat of the Rathore Government was then transferred from Pali to Mandore. He then conquered Nagore, and took Nandole and many other places; the time of Rao Chonda may, therefore, be reckoned the actual conquest of Marwar.

In 1409 A.D. Rao Chonda was succeeded by his son, Rao Rirmal, a giant in size and strength, according to local history and legends. He seized Ajmere, and restored it to Meywar, and he was also the first to enforce the equality of weights and measures throughout his dominions. He was slain while attempting to seize the throne of Meywar.

Rao Jodhá, the eldest surviving son of Rao Rirmal, succeeded his father. He conquered Sojat in 1455, and laid the foundation of the city of Jodhpore (in 1459 A.D.), which he made his capital. He had fourteen sons. By this time the

Rathores had conquered in three centuries more than 70,000 square miles of land. They were exceedingly prolific, and already numbered 50,000 cavaliers, descendants of one father. Three chiefs alone, Jodhá, his father and grandfather, produced fifty-two sons.

Rao Jodhá was succeeded by his eldest son, Sátal, who shortly after lost his life, in 1492, in a fight with the Patháns, who had carried off 140 maidens from a fair then being held at Pipár.

Dooda, the fourth son of Rao Jodhá, established himself on the plains of Merta, while Biká, the sixth son of Jodhá, founded Bikanir.

After Rao Sátal came Rao Sujá, the second son of Rao Jodhá. He occupied the *gaddi* of Márwár for twenty-seven years.

Rao Sujá's son, Baghji, died during his father's lifetime, and the succession therefore devolved upon Sujá's grandson, Gángá. It was during his reign that the Rathores fought under the standard of Meywár, led by Rana Sangá against the Mogul emperor, Babar, in the fatal field of Biana, in 1528, in which the Rao's grandson, Rai Mal, and many other brave Rajputs, lost their lives.

Rao Gángá, dying in 1531 or 1532, was succeeded by Maldeo, during whose reign Marwar attained to its zenith of power, territory, and independence. He greatly extended his dominions by conquests from neighbouring States, and before his death ruled thirty-eight districts. When Humáyun was driven from the throne of Delhi by Sher Shah, he sought the protection of Maldeo, but in vain. Humáyun was then forced to cross the desert of Sindh, and his son Akbar was born at Umarkote at that time. Soon after Sher Shah marched against Maldeo with an army of 80,000 men, and succeeded in defeating him; but the Rathores fought so desperately that at the end Sher Shah is said to have exclaimed that he had

nearly lost the empire of Hindustan for a handful of *bajra*, in allusion to the poverty of the country he had unwisely invaded. In 1561, Akbar, in revenge for Maldeo's inhospitable treatment of his father, invaded Marwar, and took Merta and the important fortress of Nagore, both of which places were then conferred on the chief of Bikanir. At the close of his life the old Rao had to stand a siege in his capital, and was obliged to yield homage, and pay it in the person of his son, Udai Singh.

Chandarsen, though a younger son, succeeded his father, Maldeo; but, in the third year of his reign, Akbar captured Jodhpore, and held it till 1583, when it was restored to Udai Singh, the Emperor's favourite.

Udai Singh ruled from 1583 to 1594. He was the first chief of Marwar who received the title of Raja from Akbar. The Emperor not only restored to Udai Singh all the possessions, excepting Ajmere, that he had wrested from Maldeo, but several rich districts in Malwa. Udai Singh ruled with a strong hand, and chastised the feudal lords who had espoused the cause of his brother Chandarsen. He was very unpopular with the Charans, as he confiscated some of their villages; he had seventeen sons and the same number of daughters.

Raja Sur Singh, who succeeded his father in 1594, attained to high honour with Akbar, for whom he conquered Gujerat and the Deccan. For his services he held five fiefs in Gujerat and one in the Deccan, in addition to his native dominions of Marwar, and he had also the title of Sawái Rájá conferred on him by the Emperor.

Raja Gaj Singh succeeded his father, Sur Singh, in 1619, and ruled till 1638. He was made viceroy of the Deccan, and served with distinction in the wars of the empire. When Prince Khurram rebelled, he marched with the Emperor Jahangir to put down the rebellion. In 1638 a serious rising broke out in Gujerat, and Gaj Singh was sent to suppress it. In his endeavour to put down the rebels Gaj Singh lost his

life. He had two sons, Amar Singh and Jaswant Singh, of whom the elder was disinherited and declared incompetent to occupy the throne of Marwar.

After the death of Gaj Singh, the succession devolved upon the second son, Jaswant Singh, who ruled for forty-two years, from 1638 to 1678. Local chronicles describe him as a sovereign unsurpassed in all princely virtues by his predecessors and contemporaries. During his long reign ignorance and darkness were dispelled from Maroo land, while learning and arts made great progress under his encouragement and patronage. He served in the war of Gondwana, where he led a force of twenty-two contingents under Aurangzeb. However, during the first twenty years of his service he played a comparatively subordinate part in the government of the empire until the illness of the Emperor Shahjehan in 1658, when Dara, as regent, appointed him Viceroy of Malwa. It was at this juncture that the civil war of succession broke out among the sons of Shahjehan, and Jaswant Singh was sent to oppose Aurangzeb near Ujjain. He could have easily crushed him, but, overconfident of the capabilities of his army, he gave him time to join with his brother Murád, so that he might have the glory of conquering two princes in one day. He was, however, oversanguine, and failed in the task he had unwisely undertaken. Maharaja Jaswant Singh hated the Mahomedans, and Aurangzeb most of all; so his whole life was spent in an attempt to ruin the Moguls, he cared not whether by force or fraud. With this object in view, he joined Aurangzeb against his brother Suja, and when the battle began he turned upon Aurangzeb's army, cut it to pieces, plundered the imperial camp, and succeeded in bringing much spoil to Jodhpore. He then joined Dara against Aurangzeb, but the Emperor offered Jaswant Singh the viceroyalty of the Deccan, which he accepted. When he reached the Deccan, he planned the death of the king's lieutenant, and then stirred up Prince Muazzam to rebel

against Aurangzeb. When another Viceroy was sent there, he had to fly for his life, and was pursued by the prince and Jaswant Singh beyond the border. In order to get rid of this powerful foe, whom he could not subdue openly, the Emperor pretended friendship with Jaswant Singh, and appointed him to the viceroyalty of Kabul; but he had his son and heir, Prithi Singh, murdered at Delhi as soon as the father was out of the way. The legend is that the boy was enveloped in a poisonous robe, from which he absorbed the noxious drug and died. The cold climate of Afghanistan killed Jaswant Singh's two remaining sons; the veteran Rathore warrior then died of grief in a foreign land, and his *chhattri* is still preserved at Jamrood.

After the death of Maharaja Jaswant Singh, his wife, who was with him, was in her seventh month of pregnancy; she made up her mind to become *Sati*, but was forcibly prevented by one of the late Raja's clansmen. On their return journey to Jodhpore, she gave birth to a posthumous son at Lahore, who afterwards ruled as Ajit Singh. When the infant prince was a few months old, the guardians resumed their journey to their native country *via* Delhi; but Aurangzeb commanded that the infant should be surrendered to his custody, in the hope of being able to destroy him. However, the Rajputs in charge became suspicious of the Emperor's intentions, and, without delivering their infant chief into his hands, they managed to escape beyond Delhi, after a severe battle, during which the infant prince was saved by being concealed in a basket, such as that carried by snake-charmers. Gokal Das Khichi, in the garb of a snake-charmer, carried the infant prince off, and intrusted him to Prohit Jagguji, whose Dhani was at Kalindri, in Sirohi, in which place he protected the young prince for seven years, after which he was taken away and concealed in the Siwana hills known as "Chhappan-ka-Pahár." Here he was visited from time to time by his clansmen, who continued to harass the Mahomedans located in the

country. After the battle at Delhi, Aurangzeb invaded Marwar, took and plundered Jodhpore. He also sacked all the large towns, destroyed the Hindu temples, and commanded that all Rathores should be forcibly converted to Mahomedanism, with the result that the Rajputs combined against him, and in the wars which ensued Aurangzeb gained little, either in honour or power. The chief leader of the Rathores, and the most faithful adherent to the infant Maharaja Ajit Singh during the critical time of his minority, was Durga Dass, a very valiant Rajput, who sacrificed everything in the service of his lord. Colonel Tod, in his annals, informs us that it was with rare fortitude, patience, valour, and devotion that such a handful of Rathores could hold their own for so long a time against such a powerful monarch as Aurangzeb. In 1680–81 he suffered a disastrous defeat at the hands of the Rathores, who supported his fourth son, Akbar, in his rebellion against his father. Years of anarchy then followed in Marwar, and the Rathores were much subdued, in consequence of the occupation of their capital by Mahomedans, when Ajit Singh, at the age of twenty-one, in 1701 A.D. put himself at the head of a large body of the clan, and marched on Jodhpore city, from which he expelled Aurangzeb's governor and killed hundreds of his garrison. The city was again taken by Bahadur Shah in 1708, and held till 1710, when it was restored to Ajit Singh by Shah Alam. Maharaja Ajit Singh was, however, not even at this period allowed to rest at his capital undisturbed. It was invested by the Sayyads, who carried off his son, Abhai Singh, as a hostage, but they were finally defeated by the Maharaja and compelled to retire from Jodhpore. Maharaja Ajit Singh was much mixed up in the intrigues of the Imperial Court; he was as brave as he was wise, and eventually came into great favour with the Emperor. He is said to have made and unmade seven successive Emperors of Delhi before he died at Jodhpore in 1724, leaving behind him five sons.

Abhai Singh succeeded to the *gaddi* and ruled for twenty-five years; he was a great athlete, the best swordsman in Rajwara, and he was given Nagore and Edar by the Emperor. He rendered great service to Mohammad Shah in subduing Sherbaland Khan, the rebel of Ahmedabad. After this he returned to Jodhpore with the spoils of Gujerat, which materially helped him in strengthening his forts and garrisons. He also, with the aid of his brother, Bakhat Singh, gained a great victory over Jai Singh, the chief of Amber.

Maharaja Abhai Singh died in 1750, and was succeeded by his son, Ram Singh. Many battles were fought between Ram Singh and his uncle Bakhat Singh for the *gaddi* of Marwar; but at last the latter conquered and was made Maharaja, although Ram Singh had the help of the Mahrattas to sustain his claims. Maharaja Bakhat Singh was a chief of great personal prowess and a great leader; his extraordinary exploits are still recounted by Chárans, and he is assigned a very high place among the rulers of the Rathore clan, both on account of his strict justice during the long period he governed Nagore, and also for his warlike achievements.

Bakhat Singh was succeeded by his son, Bijai Singh, who ruled with much difficulty, at first on account of a combination made against him by Ram Singh and Jai-appa Scindia. The united forces defeated his army at Merta, compelled him to cede Ajmere to the Mahrattas, and to pay a triennial tribute for the murder of Jai-appa Scindia, which afterwards took place in Marwar. Ram Singh died in exile in 1773; after this Marwar was free from war for a considerable time, although much harassed by Mahratta freebooters. The Rajput States were, about that time, much irritated on account of frequent raids by Mahrattas; consequently Meywar, Marwar, and Jeypore joined armies and gained a victory over Scindia and De Boyne outside the town of Merta, from which place and from Ajmere they were driven out with great loss.

However, Scindia soon rallied his army, recaptured Ajmere, and imposed a fine of sixty lakhs on the Rajputs. Bijai Singh was a vegetarian and also strictly forbade the use of liquor and other intoxicants; he died in 1794, leaving a reputation for great piety behind.

At the time of Bijai Singh's death, his grandson, Bhim Singh, was at Jaisalmir; he galloped to Jodhpore and seized the vacant *gaddi*, the rightful heir to which was Zalim Singh, the eldest surviving son of Maharaja Bijai Singh. Bhim Singh, being afraid of the rightful heir and of other pretenders, slew or drove into exile all who could lay any claim to the throne. Man Singh, who took refuge within the walls of Jalore fort, however, evaded his tyranny, although Maharaja Bhim Singh made several unsuccessful attacks on the stronghold, and endeavoured in vain to seize the person of Man Singh. Maharaja Bhim Singh died in 1804, and it is remarkable that there was no famine or scarcity during his time—a period of ten years.

Maharaja Man Singh succeeded Bhim Singh to the *gaddi* in 1804, and ruled nearly forty years, although discord and confusion prevailed during his time. The leading nobles of Jodhpore produced a posthumous son of Maharaja Bhim Singh, and, with the aid of Jeypore, nearly succeeded in wresting the State from Man Singh, who, however, with the help of Amir Khan, defeated his enemies. The nobles then left the country and took refuge at the courts of Meywar, Jeypore, Bundi, Kotah, and Bikanir, where they intrigued against and occasionally organised attacks on Marwar. Maharaja Man Singh early refused to take any part in State affairs, and nominated his eldest son, Chatar Singh, as his regent. In 1818, at the commencement of the Pindari war, a treaty of alliance was concluded between the British Government and the chief of Marwar. Chatar Singh died suddenly, whereupon his father resumed the administration. Internal

dissensions and misrule, however, continued; the Naths controlled the affairs of the State and held the Maharaja as a mere puppet in their power till 1839, when the British Government had to interfere, in order to save the State from being wholly made over to them. A British force under Colonel Sutherland held Jodhpore for five months, till order was restored.

Maharaja Man Singh, the last descendant of Abhai Singh, died without heirs, and Maharaja Takhat Singh of Ahmednagar was adopted and put on the throne in 1843. Owing to constant disputes between the Darbar and the Thakars, the affairs of Marwar remained in an unsatisfactory state for a time. Maharaja Takhat Singh was, however, a loyal chief, and did good service in the mutiny of 1857, when many European ladies found a safe asylum in his fort at Jodhpore, and during which troublesome period he did his utmost to assist the Government. He was famous for his hospitality and the excellence of his wine.

Maharaja Takhat Singh died in 1873, and was succeeded by his eldest son, Maharaja Jaswant Singh, G.C.S.I., who was born at Ahmednagar in 1837, before his father was adopted into Marwar; he succeeded to the *gaddi* of Jodhpore in 1873, and died in October 1895. He was a typical Rajput chief, dignified, courteous, genial, and generous in a high degree; he was a keen sportsman, very fond of horses, a great patron of the turf, and any broken-down jockey or needy racing man, who came to Jodhpore in his time, could rely on his sympathy and assistance. Although a strict Hindu, he was very broad-minded in ecclesiastical matters, and held that all religions were good and deserving of support. He was very charitable, and many who had met with misfortune existed on his bounty. Under Maharaja Jaswant Singh's rule much progress was made in administration in Marwar; the law courts were reformed, boundary and revenue settlements

made, outlawry and dacoity put down, and a good water supply provided for the capital. In his time many new tanks were made and old ones improved throughout the State; the railway was constructed, and the roads around Jodhpore metalled. Inland customs were regulated, and transit duties abolished. The two regiments of Imperial Service Cavalry, the State's quota to the defence of the empire, were recruited and trained, and are now well mounted, thoroughly equipped, and able to take their place in the field against any enemy to British supremacy in India. Arboriculture and forestry received particular attention, and the trees planted under the immediate supervision of His Highness have done much to improve the surroundings of Jodhpore city, and to steady the sand that formerly drifted as in the open desert, but which is now covered with trees and grass, and is fairly stable at all seasons of the year. Nearly all the hospitals adorning the capital and the dispensaries, which confer so much benefit on the sick poor of the out-districts, were established during the lifetime of Maharaja Jaswant Singh. Vaccination was made general throughout the country, and sanitation received consideration and made considerable progress during his time. Education was particularly fostered, and many schools were established, the pupils of which are largely employed in the railway and other departments of the State. Scholarships for Marwar boys were given at some of the Indian universities, and two medical studentships for female students were founded in the Agra medical school by the Maharaja, who was always pleased to advance any cause likely to benefit his own subjects or the people of India generally.

Maharaja Jaswant Singh was born outside Marwar, and this gave rise to a dispute on the death of Maharaja Takhat Singh. Maharaj Zorawar Singh, the second brother of His Highness, and the first-born of Maharaja Takhat Singh in Marwar, claimed to succeed his father, but his claim was not

recognised by the British Government, nor upheld by the Sardars of the State; so the pretender accepted the inevitable and settled down under the rightful heir's rule, giving no further trouble during the rest of his lifetime.

For many years before the death of Maharaja Sir Jaswant Singh, Colonel Maharaj Dhiraj Sir Pratap Singh, G.C.S.I., carried on the government of the State; but the chief was ever ready with good advice when it was needed, and he had absolute confidence in the loyalty of his younger brother. Consequently good government was established out of comparative anarchy, and marked progress took the place of a tendency to decay.

Maharaja Jaswant Singh's influence was great among the ruling chiefs of Rajputana, and he did much to improve the relations between the different States; his judgment was considered sound, and he was often consulted by his contemporary rulers, both within and beyond the borders of Rajputana. His loyalty to his suzerain was, under all circumstances, staunch and unflinching, and this had a good effect on the malcontents and restless in many parts of India.

Maharaja Jaswant Singh had his salute increased to twenty-one guns, as a personal distinction; he received the G.C.S.I. from the Queen-Empress, and the outlying and once turbulent district of Málláni was restored to Marwar, on account of the strong and sound government established during his lifetime.

His Highness Maharaja Sardar Singh succeeded his father, Sir Jaswant Singh, on the 24th of October 1895, and was invested with full powers on the 18th of February 1898. He is now in his twentieth year, and promises to have many of the sterling and generous qualities of his distinguished father. He is an excellent horseman, a good polo-player, and has already shown considerable ability in dealing with the administration of his State.

Principal Events of His Highness the Maharaja Jaswant Singh's Reign.

March 1873.—His Highness succeeded to the *gaddi*.

23*rd December* 1875.—His Highness visited His Royal Highness the Prince of Wales at Calcutta; he was then invited to attend the Grand Chapter of the Star of India, and decorated with the G.C.S.I. by His Royal Highness on behalf of Her Majesty.

1877.—His Highness attended the imperial assemblage at Delhi, and had his salute increased from seventeen to twenty-one guns (1st January).—The chiefs of Jodhpore and Oodeypore interchanged visits at Delhi, although these houses had long been at variance before this.

1877–78.—Marwar suffered from scarcity of grain and a grass famine of unusual severity.

27*th January* 1878.—A son and heir was born, who shortly afterwards died.

1878–79.—Maharaj Pratap Singh was appointed minister, and he accompanied Sir Neville Chamberlain on his mission to Kabul, for which he was subsequently created a C.S.I. His Highness's loyalty was evinced by his readiness to place his troops at the disposal of Government, both on the occasion of the Malta expedition and the Afghan war.

1880.—Major P. W. Powlett took over political charge of the Western Rajputana States (2nd January), and, with Maharaj Pratap Singh, commenced the reforms which have done so much to establish good government in Marwar.—A son and heir (the present Maharaja) was born (11th February) to His Highness, who set a good example in having his infant, the Maharaj Kunwar, vaccinated, in spite of much opposition from within the palace.

1881.—The Jodhpore Railway was commenced (16th February).—Captain W. Loch was appointed boundary settlement officer, and afterwards took charge of the revenue and customs.

1881–82.—The combined political charge of the three

Western Rajputana States was denominated the Residency.—A complete reform of customs duties introduced into Marwar by Mr. Hewson.

1882.—Mr. Home was appointed manager of the Jodhpore Railway (17th April), and shortly after took charge of the whole Public Works Department of the State.

1883.—The head-quarters of the Resident were moved from Erinpura to Jodhpore.—Lala Hardyal Singh was appointed to Jodhpore (August).

1884.—A Municipal Committee was formed with the Residency Surgeon as president (July).—His Highness proceeded to Calcutta on a visit to His Excellency the Marquis of Ripon, and to welcome the Earl of Dufferin, the new Viceroy (November).—The Khalsa villages were made over to Captain Loch for summary settlement and management.

1884–85.—The powers of Jagirdars, within their respective jagirs, to try civil and criminal cases were defined.

1885.—His Highness proceeded to Oodeypore on a condolence visit after the death of Maharana Sajjan Singh (January).—His Excellency the Viceroy, Lord Dufferin, visited Jodhpore (16th November).

1885–86.—The old postal arrangements were abolished, and the imperial system introduced at all pargana headquarters.

1886.—The Maharaja paid a visit to His Royal Highness the Duke of Connaught at Poona (September).—K.C.S.I. was conferred on Maharaj Pratap Singh.

1887.—The Jubilee of Her Majesty's reign was celebrated with brilliant display (16th February), and his Highness gave Rs.111,000 to the Imperial Institute. The Luni-Pachbhadra extension of the Jodhpore Railway was opened for traffic (23rd March).—Maharaj Sir Pratap Singh sailed for England (1st April), to represent His Highness the Maharaja at the Jubilee of the Queen-Empress. He was made an honorary Lieutenant-Colonel in the British army, and an A.D.C. to His Royal Highness the Prince of Wales.—Maharaj Sir Pratap Singh returned from England (August).

1887–88.—Under the presidency of Maharaj Sir Pratap

Singh a Council, consisting of eight members, with Pandit Sukhdeo Prashad as its judicial secretary, was appointed.—Two new dispensaries, one at Jalore and the other at Merta, opened.

1888.—His Highness the Maharaja of Mysore visited Jodhpore (3rd February).—His Highness opened the Hewson General Hospital in person (15th February).—His Highness made an offer to Government of ten lakhs of rupees for frontier defence.

1888–89.—A Forest Department was established.

1889–90.—Four of the principal Jagirdars, viz., Pohkaran, Kuchawan, Asope, and Nimaj, were admitted to the Jodhpore Council.—Balsamand tank and canal completed.

1890.—His Royal Highness Prince Albert Victor visited Jodhpore (February).—The Darbar completely abolished transit duties (April).—His Excellency Lord Lansdowne visited Jodhpore (November).

1891.—His Imperial Highness the Cesarewitch of Russia visited Jodhpore (January).—The sister of His Highness the Maharaja of Jodhpore was married to the Maharao of Bundi (February).—The Grand Dukes Alexis and Sergius of Russia visited Jodhpore (April).—His Highness the Gaikwar of Baroda visited Jodhpore (21st August).—The civil administration of the district of Mallani was made over to the Darbar (August).

1891–92.—An elaborate system of supervision for the control of Minas, Baoris, Kolis, Bhils, and Bagris was established, the import duty on rice from Sindh abolished, a new Residency completed and the old one at Sursagar abandoned, the nobles' school at Jodhpore converted into a preparatory school for the Mayo College.—For the first time for generations, His Highness the Maharaja of Bikanir visited Jodhpore.

1892.—Pandit Sheonarain, the private secretary to His Highness, died (8th February), and was succeeded by his son, Pandit Dina Nath.—The marriage of His Highness the Maharaja's son and heir took place with the sister of His Highness Maharao of Bundi (20th February), and on this occasion ten ruling chiefs visited Jodhpore.

1892–93.—The boundary settlement was finished.—The Maharana of Oodeypore, the Maharao of Kotah, the Maharaja

of Kolapore, and His Imperial Highness the Archduke Franz Ferdinand of Austria visited Jodhpore.—His Highness the Maharaja of Jodhpore paid a visit to Bikanir, and a condolence visit to Ulwar after the death of the chief there.

August 1893.—The Jaswant College was affiliated to the Allahabad University in Arts, up to the Intermediate Standard.

1893–94.—The Bigori system of revenue settlement was successfully introduced.

1894.—The new jail was completed and occupied (March). —The Maharaj Kunwar was appointed secretary to the Musahib Ala on the death of Munshi Hardyal Singh (July).

1894–95.—The chiefs of Bikanir, Kotah, Bundi, Ulwar, Jaisalmir, and Narsingarh visited Jodhpore.

11*th October* 1895.—His Highness the Maharaja Sir Jaswant Singh, G.C.S.I., died at the age of fifty-seven. His Highness ascended the *gaddi* in 1873, and had, therefore, ruled over Marwar more than twenty-two years.

24*th October* 1895.—The late Maharaja was succeeded by his only son, His Highness Maharaja Sardar Singh, who was then in his seventeenth year.

1895–96.—The Jaswant Sagar tank, costing about nine lakhs of rupees, was completed.—The chiefs of Oodeypore, Jeypore, Bikanir, Kotah, Bundi, Kishengarh, Dholepore, Jaisalmir, Patiala, Rutlam, and Sailana paid condolence visits to Jodhpore.

1896.—Her Excellency Lady Elgin opened the Jaswant Hospital for Women, founded in memory of the late Maharaja, Sir Jaswant Singh (24th November).—His Excellency the Viceroy, Lord Elgin, opened the new Rajput school at Mandore (25th November).

1896–97.—The revenue settlement was completed.—A B.A. class was established in the Jaswant College.

1897.—Maji Panwarji, the mother of His Highness the Maharaja, died (1st February).—A new dispensary at Bhatki was opened (1st February). — Lieutenant-Colonel Maharaj Dhiraj Sir Pratap Singh proceeded to England (29th April) to represent the Jodhpore Imperial State Cavalry on the

occasion of the Jubilee celebration in London. He was invested by Her Most Gracious Majesty the Queen, Empress of India, with the insignia of a Knight Grand Commander of the Order of the Star of India, and had also the degree of LL.D. conferred on him by Cambridge University.

On both occasions of his visits to England, Sir Pratap Singh was highly gratified with the kindness he received from the Queen-Empress, and everybody there. He considers Her Majesty a most wonderful woman, and well worthy of her very exalted position, apart from right of birth. Her capacity for work and ceremonial, her dignity and authority, her kindness and consideration have quite overcome him, and made him give up all his early prejudices against women as being unfit for rule and command. The city guilds, the banks, the manufacturing centres, the shipping, the navy, the public schools and universities, all brought home to him the greatness of the country. However, on his first visit, he was utterly surprised and astonished at the poverty of "the East-end" community; he had never previously realised that there were poor in England. He thought Englishmen were made up of two classes, the "Sahibs" and "Chhota Sahibs," the latter being "Mr. Atkins" and "the Jockey Lōg," both of whom he had always seen in comfortable circumstances here. He attributed the poverty of East London to the want of fields to till, and it never occurred to him that any Britisher should have a natural aversion for work. He thought that it would be good, both for Marwar and England, if the Great Unemployed were drafted from "the East-end" into Marwar, and settled as cultivators here. "There is land and to spare for the whole of them under His Highness the Maharaja of Jodhpore, and why should they not have it?" The desert would no doubt soon smile with abundant harvests, and commodious and comfortable homesteads would rapidly replace the present beehive huts, when in the hands of an industrious, honest, and thrifty English population. The question of providing for the congested slums would then be satisfactorily and finally settled, with advantage both to India and England. We do not think the gentle Brahmin

Sirohi Palace.

To face page 61.

SHORT HISTORY OF SIROHI

The present reigning family of Sirohi are Deora Rajputs, a branch of the Chohán Rajputs, and are said to be immediately descended from one Deoraj, the son of Manji or Súrang, a descendant of Prithvi Raj, the Chohán king of Delhi.

Very little is known of the early history of Sirohi State. From the records it appears that the original inhabitants were Bhils. Following the Bhils, the Gehlots were the first Rajputs to settle in Sirohi. They were shortly succeeded by the Pramars, who had their capital at Chandravati, on the banks of the Banás, a few miles to the south-east of Abu, and ruled south to the Narbadá, and west to Umarkote and Sindh. The ruins of that once magnificent city are still to be found, buried in a dense and desolate jungle. The Pramars were succeeded by the Choháns, who, about A.D. 1152, established themselves along the western border of Sirohi, where Sohi Rao, the Chohán leader, took Bhinmál and Sanchore. Sohi Rao was the son of the famous Lakhamsi, Raja of Nadole in Marwar. The Choháns appear to have gradually established themselves in their newly acquired territory; and Rao Géynhú, the sixth in succession from Sohi Rao, the grandfather of Deoraj, the founder of the Sirohi house, built the fort of Jalore, which has since fallen to the Rathores, and is now in Marwar territory, a short distance from the north-west border of Sirohi.

We now come to the birth of Deoraj, the first of the Deora clan of Rajputs, who may be considered as the founder of the Sirohi house. Nothing particular is recorded in regard to Deoraj, but his son Agarsen is said to have taken Chandravati

from the Pramars in A.D. 1302. The latter had constructed extensive fortifications on Mount Abu, and rendered it an impregnable stronghold, in order to gain possession of which the Deora Chohâns had to resort to treachery. A proposal was sent to the Pramars that they should bring twelve of their daughters to be married into the Chohán tribe, and thus establish a friendship between them. The proposal was accepted, and the twelve girls, daughters of this clan, were accompanied down the hill by nearly all the Pramars, when they were set upon and slaughtered by the Deoras, who followed the few survivors back to Abu, and gained possession of the place. The people styled Lok, who still inhabit Abu, are descended from the Pramars who survived, and on account of this evil act on the part of the Chohâns, they never allow their daughters to go down to the plains to be married.

In 1405 Rao Sobhaji built the town of Sirohi, situated in a bay of the hills near the site of the present capital. He was succeeded by his son Rao Sains Mal, who, in A.D. 1425, built a new city on the slope of the hills, which was also called Sirohi, and is the present capital of the State. During the reign of Sains Mal, Rana Kumbhaji of Chittor, with the permission of the second son of Sains Mal, took refuge on Mount Abu from the Delhi emperor's army. When the danger was past, the Rana refused to leave, whereupon Deraji, the eldest son of Sains Mal, marched to Abu with a force and expelled the Rana and his men from the hill. In consequence of this affair, the Rao swore that no Raja should ever be allowed to ascend Abu. The oath was kept till 1836, when, at the intervention of Colonel Spiers, the then political agent of Sirohi, the Maharana of Oodeypore, was permitted to proceed to Abu on a pilgrimage, and since then many chiefs of Rajputana have visited Abu.

The chiefs of Marwar repeatedly attacked Sirohi, but the natural defences of the country, and the inherent heroism of

its valiant defenders, baffled their attempts for a long time. Sirohi was the maternal home of Rao Maldeo of Marwar, who invaded it with a large army, came out successfully, and left a garrison there.

In 1565 Rao Sultan Singh came to the *gaddi* of Sirohi. He ruled fifty-one years and fought fifty-two battles.

In 1572 an imperial army, under the command of Mir Mahmud Khan, marched against Sirohi, but without any great results. Akbar then came down in person to Sirohi, to assume command of the army. The Rajputs fought very bravely, and the Rao did not then acknowledge the supremacy of the Mogul Emperor.

Raja Sur Singh of Marwar next invaded Sirohi at the head of a large army on behalf of the Emperor. He plundered the country, but could not conquer it. Subsequently, Kunpawat Mukand Dass, a vassal of Marwar, was intrusted with the command of a large imperial army and ordered to march against Sirohi. The Rathore commander succeeded in capturing the Rao while asleep in one of the mountain retreats of his country. Mukand Dass first took the Rao to Jodhpore and thence to Delhi. Before he was admitted to the Emperor's presence, the Rao was asked to observe the etiquette of the court; but he replied that his life, and not his honour, was in the Emperor's hands, and that he would never bow his head even at the peril of his life. The Emperor was much pleased with his undaunted bravery. Rao Sultan Singh was a valiant and reckless prince. The hostilities between the Sirohi and Marwar princes grew more bitter day by day, till at last the Rao was compelled to sue for peace by offering the hand of his daughter in marriage to Maharaja Abhai Singh.

At the beginning of the present century, in the time of Rao Udai Bhan, Sirohi suffered much from wars with Marwar and the maraudings of the wild Minas. The State became

too weak to protect its subjects, and was nigh being dismembered, as many of the Thakars threw off their allegiance. It was under these circumstances that, in 1817, Rao Sheo Singh sought the protection of the British Government. A long inquiry was made by Captain Tod, then Political Agent, Western Rajputana States, and in September 1823 a treaty was concluded between Sheo Singh, regent of Sirohi, and the British Government. In 1843, by consent of the Rao of Sirohi, Government established a sanitarium on Mount Abu. In 1854 affairs had become so alarming that, at the urgent request of the Rao, the British Government had to advance a loan of two lakhs, and take over the administration for eleven years. This was rendered necessary by the bad condition to which the State was reduced owing to the constant rebellions of the Thakars, and the raids of Bhils, Minas, and other freebooters, who found a secure refuge in the hills and forests of the country.

In 1861, in consequence of the incapacity of Sheo Singh, the general control of affairs was made over to his second son, Ummed Singh, the old Rao retaining the dignities and honours of office till his death on the 8th of December 1862. Rao Sheo Singh had a long reign of forty-four years. He did good service during the Mutiny of 1857, in consideration of which his tribute, previously fixed at 15,000 Bhilari rupees, was reduced by one-half.

His Highness the Rao Ummed Singh was, on the 1st September 1865, under the sanction of the Government of India, invested with full authority throughout his State. Being priest-ridden, easy-going, and intensely conservative, the Rao soon let his State drift into debt and difficulties. In other respects the late Rao was a kind and well-meaning ruler, free from vices and peculiarly happy in his domestic relations. The principal events of his time were: the great famine of 1868–69; the outlawry of Nathu Singh; and the

frequent incursions of the Bhils and Minas from the Marwar border.

The famine of 1868–69 killed 75 per cent. of the cattle. Numbers of people also perished, although relief works were kept up by the Darbar at Erinpura, Abu, and Anadra. Grain rose to $4\frac{1}{2}$ seers per rupee, and in 1869 the distress was increased by a visitation of locusts.

The outlawry of Nathu Singh proved a great misfortune to the State. All the measures taken for his apprehension failed, and during his time freebooting Bhils and Minas made constant incursions into the Sirohi State, plundering in his name, and terrifying the peaceable inhabitants. At one time, the main road through Sirohi to Ahmedabad was so unsafe for travellers and merchandise, on account of these robbers and outlaws, that traffic on it practically ceased. Finally, Colonel Carnell was vested with special powers, and, with the aid of the Erinpura force, reduced the whole country to a condition of peace and order. Nathu Singh died at a village in Marwar near the Sirohi border towards the end of 1870. His son, Bharat Singh, with the remaining members of the band, continued in outlawry till the middle of 1871, when they were called in and re-settled.

The late Rao Ummed Singh died at Sirohi on the 16th of September 1875. He had only one Rani and two children; one, a daughter, and the other a son, the present Maharao, Kesri Singh, who succeeded his father.

The present chief of Sirohi, Maharao Kesri Singh, K.C.S.I., succeeded his father, Rao Ummed Singh, and was invested with full ruling powers on the 24th of November 1875. He had the title of Maharao conferred on him by the Queen-Empress in 1889, and was made a K.C.S.I. in 1895 for his good services to his State.

His Highness Maharao Kesri Singh, K.C.S.I., has done much to improve the condition of the Sirohi State. Good

government has been established out of comparative anarchy; regular courts of justice have been formed. With Colonel Powlett's assistance, the Bhils and Minas were settled down some years ago. Boundaries have been demarcated, and much waste land has since been brought under cultivation. A jail has been built on modern hygienic principles; hospitals have been founded, and vaccination has progressed.

Principal Events of His Highness the Maharao Kesri Singh's Reign.

May 1876.—His Highness the Rao was married to a daughter of the Rana of Danta.

1877.—The assumption of the title of Empress of India by Her Majesty was proclaimed in full Darbar at Sirohi, before a large assembly, and the day was observed as a general holiday by all classes.—The Rao started on a pilgrimage, taking with him his late father's ashes (June). He visited Benares and other holy cities, and then went on to Calcutta, which made a good impression on the young chief.

1877–78.—A grain as well as grass famine occurred.

16*th February* 1887.—The Jubilee of Her Majesty's reign was celebrated in the capital of Sirohi, and contributions made to the Imperial Institute and Countess of Dufferin's Fund.

1887–88.—Owing to the increase of revenue and general prosperity of the State, the Darbar was able to grant to the Abu municipality an annual sum of Rs.3000, thereby relieving the British Government of its grant in aid.—The bridge over the Banás river was commenced, and the road leading over it from the railway station towards Abu metalled.

1888–89.—Two sons were born to His Highness the Maharao of Sirohi; one of whom died, and the other is his heir-apparent.

1889.—The Agent to the Governor-General held a Darbar at Sirohi for the purpose of presenting the chief with the *sanad* of the hereditary title of Maharao, conferred by the Queen-Empress (March).—The bridge over the Banás river, near Abu

Road railway station, was completed at a cost of Rs. 100,995, subscribed by the principal chiefs of Rajputana.

1890.—On his way to Bombay, His Royal Highness Prince Albert Victor was the guest at Abu Road of His Highness the Maharao of Sirohi.—His Excellency the Viceroy, Lord Lansdowne, was the guest of His Highness the Maharao of Sirohi, and visited Mount Abu (November).

1890–91.—Forest conservancy was started in the Sirohi State, in the immediate neighbourhood of Abu.

March 1891.—The Agent to the Governor-General visited Sirohi, and laid the first stone of a new jail.

March 1892.—An influential body of Minas assembled at Sheoganj, near Erinpura, to enter into an agreement to give up raiding and settle down to agriculture. Rules were also then made for the curtailment of marriage expenses, and the settlement of disputes among the tribes.

1892–93.—The new jail was completed and occupied.—Another son born to His Highness the Maharao of Sirohi.

1893–94.—The notorious dacoit, Kalia Rabari, was captured.—A new dispensary opened by the Darbar at Sheoganj.

1894–95.—A Forest officer was appointed.—The registration of vital statistics commenced.

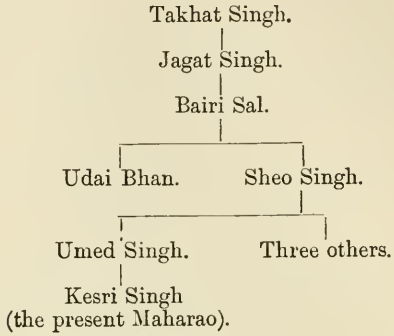
1*st January* 1895.—His Highness the Maharao of Sirohi was created a K.C.S.I.

1895–96.—The Sirohi-Meywar border line was settled.

1897.—The Diamond Jubilee of Her Most Gracious Majesty the Queen-Empress of India was celebrated (22nd June).—Sir Robert Crosthwaite visited Sirohi, and formally opened the new Crosthwaite Hospital (December), the foundation-stone of which had been laid by him in the previous December.—The revenue for this year was consderably in excess of that for 1896, viz., Rs. 421,587 against Rs. 382,325. A new dispensary building was constructed at Sheoganj.—The staff of vaccinators increased, and the State divided into vaccination circles.

His Highness Kesri Singh, K.C.S.I., the Maharao of Sirohi, is entitled to a salute of fifteen guns.

GENEALOGICAL TREE OF THE RULING FAMILY.



SHORT HISTORY OF JAISALMIR

The ruling family of Jaisalmir are Yadu Bhati Rajputs, descended from Yadu or Jadu, whose progenitor was Budha, the founder of the Chandarwansh or Lunar race, and whose power was paramount in India at a very remote period of the world's history.

According to the chronicles of Hindustan, Prayaj and Mathura (Allahabad and Muttra) were the ancient capitals of the Chandarwanshi kings at the time they ruled the greater part of India. Shri Krishna, the deified leader of the Yadus, was the forty-sixth in descent from Yadu, and ruled at the famous city of Dwarka. On his death the tribe became broken up. Two of his sons proceeded beyond the Indus and settled there. Some time after this, one of their descendants, Gaj, twelfth in descent from Shri Krishna, founded the town of Gajni (Ghazni) in Afghanistan, and called it after himself. Gaj was defeated and killed in a battle with the king of Khorasan. The tribe was then driven southward into the Punjab, where Saliwahan, eighty-eighth in descent from Shri Krishna and son of Gajsen, built Saliwáhanpur close to Lahore, and conquered the whole country around. The grandson of Saliwahan, named Bhati, ninetieth in descent from Shri Krishna, was a great warrior, and conquered many of the neighbouring princes. From him the patronymic was changed and the tribe was thenceforth called by his name. Shortly after this Mahmud of Ghazni made one of his great expeditions into India against the Bhatis, and again they were driven southward. Crossing the Satlaj, they found refuge in

the great Indian desert adjacent to Jaisalmir, which for 900 years has been their home.

The early history of the Jadu Bhati race shows that they are undoubtedly a very ancient family.

The Bhatis, subsequent to their entry into the desert tract, were engaged in constant struggles with the neighbouring tribes, whom they gradually overcame. The capitals of their desert kingdom were successively Tanot, Deorawal, Lodorva, and Jaisalmir. The fortress of Tanot was built by Rao Keharji, who named it after his son Tanuji, and fixed the capital there.

Twelve years after the birth of Deoraj, which occurred in the year A.D. 836, his father and 1300 of his kinsmen were treacherously massacred by the Barahas, a neighbouring tribe, during a marriage festival. Deoraj escaped. He founded Deorawal in A.D. 853, and afterwards headed an army of his clansmen which captured Lodorva, the principal town of the Lodra Rajputs, which he made his capital. Deoraj took the title of Rawal, and established the Bhatis in the desert; so he is counted the real founder of the Jaisalmir family. He is said to have died at the very advanced age of a hundred and thirty-eight.

The Bhatis gradually extended their possessions southwards, and many of them became freebooters, a character they have sustained up to the present. In 1156, Jaisaldeo, the sixth in descent from Deoraj, founded the fort and city of Jaisalmir, at a distance of eight miles from Lodorva, as the site was more easily fortified. The princes who followed Jaisaldeo were warlike, and constantly engaged in battles and raids. So the Emperor Alaudin on two occasions, in 1294 and shortly afterwards, despatched against them an imperial army, which captured and sacked the fort and city of Jaisalmir, and for some time it remained completely deserted. In the sixteenth century the Bhatis formed an alliance with the

Amirs of Sindh against the Rathores of Marwar, and gave the latter much trouble.

The twenty-fifth prince in descent from Jaisaldeo was Rawal Sabal Singh, who was the first Jaisalmir prince to acknowledge the supremacy of the Delhi Emperor, Shah Jehan. During his reign the territories of Jaisalmir extended to the banks of the Satlaj in the north, to the borders of the Indus in the west, to the outskirts of Marwar in the south, and to the boundaries of Marwar and Bikanir in the east. The Thakar of Pohkaran, now the chief noble of Marwar, was then under the Jaisalmir raj.

Sabal Singh was succeeded by his son Amar Singh in 1661, a wise and a valiant prince, who defeated an army sent against him by Anup Singh of Bikanir.

After the death of Amar Singh, Jaswant Singh was placed on the *gaddi* in 1703. He was neither wise nor valiant, and during his reign the Rathores wrested many districts from Jaisalmir.

After the death of Jaswant Singh, his brothers and son, Akhai Singh, contested the *gaddi*, which was won by Akhai Singh in 1722. He was, however, a weak ruler, and so lost a great portion of his dominions before his death.

Akhai Singh died in 1762, and was succeeded by Mulraj, who ruled till 1820. During his lifetime the State was left in the hands of Salem Singh, his Dewan, who devastated the country by his cruelty and barbarity. He drove out the Palliwal Brahmins, who were famous cultivators, and whose well-built villages still stand deserted, to mark an era of prosperity in the Jaisalmir State which can hardly ever be again attained. In 1818, Jaisalmir acknowledged the supremacy of British power, and on the 12th December of that year concluded a treaty therewith, by which the *gaddi* was secured to the heirs of Mulraj. Jaisalmir was the last State in Rajputana to receive the protection of the British Government.

Rawal Mulraj died in 1820, and was succeeded by his grandson Gaj Singh, who, like his predecessor, was a mere tool in the hands of his minister, Salem Singh, till the latter died in 1824 of poison, administered by his own wife.

During the Sindh war of 1838–39, Rawal Gaj Singh supplied camels to the British for transport, and was rewarded by the restoration to him of Shahgarh, Garsia, and Gatuda, which had been wrested from Jaisalmir by Amir Ali Murad of Sindh.

Rawal Gaj Singh died in 1846, and was succeeded by an adopted chief, Ranjit Singh, the son of Thakar Kesri Singh, a member of the reigning house. In 1862 a *sanad* was granted by the Supreme Government, which authorised the chiefs of Jaisalmir to adopt in the absence of male offspring.

Ranjit Singh died in 1864, and was succeeded by his younger brother, Maharawal Bairi Sal, who died in 1891 without issue. The present chief of Jaisalmir, Maharawal Saliwahan, is only thirteen years of age. He was adopted by the Maharani from the house of the Lathi Thakar, a near relation of the late Maharawal. He is a promising boy, and is now resident in the Mayo College, where he has the advantages of high education and thorough training, which were not possible for any of his predecessors.

Chief Events of His Highness Maharawal Bairi Sal's Reign.

1864.—Maharawal Bairi Sal succeeded his brother, Maharawal Ranjit Singh, in his sixteenth year, having been adopted by the Dowager-Queen.

1868–69.—The great famine of 1868–69 affected Jaisalmir, but in a less degree than more densely-populated countries. Many of the men were engaged with their camels in importing grain from Sindh to Marwar, and in this way tided over a bad time.

December 1873.—His Highness the Maharawal was married to a daughter of the Rawal of Doongarpore.

1887.—A Darbar was held by the Maharawal in honour of the assumption by Her Majesty the Queen of the title of Empress of India. Everything was done by His Highness to show his appreciation of the occasion, and the day was observed as a holiday in the distant capital of the Bhatis.

1877–78.—Like Marwar, Jaisalmir suffered from deficient rainfall and famine.

1889–90.—During the cold weather of this year 141 miles of the Marwar-Jaisalmir border were demarcated.

1890.—Dewan Jag Jewan Rai Bahadur, who has done much to improve the Jaisalmir State, was brought from Kutch Bhuj, and appointed Dewan by the late Maharawal, which office he still holds.

10*th March* 1891.—His Highness the Maharawal Bairi Sal died, and Maharawal Saliwahan, a boy of five, son of Thakar Khushal Singh of Lathi, was adopted, and recognised by Government as his successor.

1892.—A dispensary was established.

1894.—The young Maharawal and his brother Dan Singh joined the Mayo College, Ajmere.

The Maharawal of Jaisalmir enjoys full civil and criminal powers, and is entitled to a salute of fifteen guns.

The family deity of the rulers of Jaisalmir is Swanjiji. Swanj was an invincible spear, belonging to Jura Sandh, king of Maghaddesh or Behar. Kalka Devi obtained the spear from him, and wielded it to help the Jadus or Jadons, who thenceforth worshipped her under the above-mentioned title.

Genealogical Tree of the Bhati Ruling Family.

Deoraj, Mudhji, Wachuji, Dusaji, Bijaya Raj, Bhojdeo, Jaisaldeo (A.D. 1156), Saliwahan (1168), Bijalji (1190), Kelanji (1191), Chachakdeoji (1208), Karanji (1243), Lakhansenji (1271), Punpalji (1275), Jetsiji (1276), Mool Raj (1293), Dudaji (1300), Garhsiji (1317), Keharji (1335), Lakhmanji

(1395), Bersiji (1440), Chachakji (1450), Devi Das (1457), Jet Singh (1479), Lunkaran (1530), Maldeoji (1551), Hairajji (1562), Bhimji (1578), Kalyan Dass (1624), Manohar Dass (1634), Ram Chandra (1648), Sabal Singh (1651), Amar Singh (1661), Jaswant Singh (1703), Budh Singh (1708), Akhai Singh (1723), and Mool Raj (1762), Gaj Singh (1820), Ranjit Singh (1846), Bairi Sal (1864), Saliwahan (1891) (the present Maharawal).

The Marwar Agency was first established by Government in 1840. The Sirohi Agency was first established in 1823, and Jaisalmir was placed in charge of the Political Agent, Jodhpore, in 1869. In February 1880, the combined political charge of Marwar, Sirohi, and Jaisalmir was denominated the Political Agency, Western States, Rajputana, and afterwards Political Residency, Western Rajputana States.

List of Residents, Western Rajputana States

No.	Name.	From	To	Remarks.
1	Major P. W. Powlett	3rd Jan. 1880	24th Aug. 1880	
2	Major A. R. T. M'Rae	25th Aug. 1880	1st Nov. 1880	Temporary
3	Lieut.-Col. W. Tweedie	2nd Nov. 1880	14th Dec. 1881	Officiating
4	Lieut.-Col. P. W. Powlett	15th Dec. 1881	24th Sept. 1884	
5	Lieut.-Col. C. A. Baylay	25th Sept. 1884	24th Dec. 1884	Officiating
6	Lieut.-Col. P. W. Powlett	25th Dec. 1884	4th April 1886	
7	Lieut.-Col. H. P. Peacock	5th April 1886	10th Dec. 1886	Officiating
8	Colonel P. W. Powlett	11th Dec. 1886	19th Aug. 1889	
9	Major W. Loch	20th Aug. 1889	19th Nov. 1889	Temporary
10	Col. P. W. Powlett, C.S.I.	20th Nov. 1889	9th April 1892	
11	Lieut.-Col. H. B. Abbott	10th April 1892	3rd May 1893	
12	Lt.-Col. W. H. C. Wyllie, C.I.E.	4th May 1893	2nd Nov. 1893	Officiating
13	Lieut.-Col. H. B. Abbott	3rd Nov. 1893	21st Mar. 1895	
14	Lieut.-Col. J. H. Newill	22nd Mar. 1895	26th June 1895	Officiating
15	A. H. T. Martindale, Esq., C.S.	27th June 1895	27th Oct. 1895	Officiating
16	Lieut.-Col. H. B. Abbott	28th Oct. 1895	17th Dec. 1895	
17	Lieut.-Col. A. Adams, I.M.S.	18th Dec. 1895	17th Jan. 1896	Temporary
18	Col. H. B. Abbott	18th Jan. 1896	13th April 1897	
19	A. H. T. Martindale, Esq., C.S.	14th April 1897	16th Mar. 1898	
20	Major T. C. Pears	17th Mar. 1898	24th April 1898	Temporary
21	Lt.-Col. C. E. Yate, C.S.I., C.M.G.	25th April 1898	11th Dec. 1898	Officiating
22	Lt.-Col. W. H. C. Wyllie, C.I.E.	12th Dec. 1898	11th April 1899	
23	Lt.-Col. C. E. Yate, C.S.I., C.M.G.	12th April 1899	Present time	Officiating

City Gate, Jodhpore, with Water-carrier's Bullock and Carrying-camel.

To face page 75.

CAPITALS OF STATES.

JODHPORE.

JODHPORE, the capital city of Marwar or Jodhpore State, lies in latitude 26° 17′ N. and longitude 73° 4′ E. It has an area of about two square miles within its walls, and is distant west from Calcutta 1128 miles; south-west from Delhi 358 miles. It was founded in A.D. 1459 by Rao Jodha, and since that date it has been the seat of the Government of Marwar. It is situated on the south-eastern slope of a small broken range of hills about twenty miles in length, running north-east and south-west, chiefly of red sandstone. The peak or rock on which the fort is built is sandstone, with an acid lava formation underneath, which projects to the surface in a few places; on the northern side it has cones of porphyry and volcanic masses of various descriptions, placed in juxtaposition to the sandstone, and it rises to the height of about four hundred feet. The layers of sandstone rock are usually parallel with the horizon, and they generally rise abruptly out of the sand below, but they are sometimes visibly supported by trap or metamorphic rock. In some places porphyritic trap is ranged in stairs, and has apparently been thrown up at a later date than the sandstone, without having materially damaged the stratification of the latter,

The city lies close below the fort, and surrounds it on all sides, except the north. It rests on an irregular sloping ground, continuous above with the base of the rock on which the fort stands, the higher part of the site being solid stone, the lower deep sand. The north side of the base of the fort

rock being wholly occupied by a rugged neck too much broken to afford good building ground, is therefore without any population or houses, excepting six or seven temples and a few *chhattris*. There are four bunds or dams on that side, the chief of which are Dev Kund and Bhawani Kund. The surrounding wall of the city is massive and strong, generally composed of large blocks of cut stone cemented together with lime. It is 24,600 feet long, 3 to 9 feet thick, and 15 to 30 feet high, strengthened in many places by towers, buttresses, and ramparts for artillery, supporting a complete line of battlements, and having loopholes, barbicans, and bartisans for defensive operations. This wall is much higher, thicker, and stronger nearer the city gates on the low ground than on the high rocky ridges, which are in some places scarped and steep, and naturally well suited for defence. There are about a hundred towers and seven gates in this wall. Each gate bears the name of the place to which it leads, viz., Mertia, Sojatia, Jalori, Siwanchi, Chandpole, and Nagori. The seventh gate has been built up for many years, having never been much used, as it has always been considered a weakness in the defences of the city.

The first or the main gate, situated in the east of the city, is Mertia. It is built of huge blocks of cut stone, cemented together, flanked by massive towers, and surmounted by defensive battlements. It has chambers for guards, and a protecting wall running from one side across the front to protect it from artillery and rushes on it from without. Its height is about 35 feet. It has a dome on the top, and a door of considerable strength, iron-clad, studded with strong pointed spikes of iron, to protect it against elephant-ramming in time of war. The city is extending outside this gate, and there is now a considerable suburb in this direction with shops and temples, and the Jubilee offices are not far distant.

The Sojatia, which is hardly a less important gate, is very similar to the Mertia in construction, but it is a little stronger

Temples and Dhanmandi, Jodhpore.

To face page 77.

and higher, and has three dome-like chambers on its top instead of one. It is situated in the south side of the city, and the suburb beyond it is now increasing with great rapidity, so that it will shortly be well within city limits. The road leading from this gate passes the Jaswant College, Darbar High School, jail, ice and soda-water factories.

The Jalori gate, situated in the south wall, is similar in shape, but less massive than those already described. It is in the direction of the railway station, and has a rapidly growing suburb without, principally private houses of important officials. There are several free Sarais in this direction, and also the Dak bungalow.

The Siwanchi gate, looking south-west from the city, is smaller, though somewhat similar to those already mentioned, and it has no important suburb or road leading from it. The chief Hindu cremation ground—"Bhandelao"—is outside this gate, and there are some artistic monuments adjacent to it.

The Chandpole gate (*Chand* = moon, and *Pole* = gate), which is so named on account of the new moon being visible in that direction, looks south-west from the city. It is similar in shape although smaller in size than the other main gates. It is situated on the high ground under the fort, and has now an extensive suburb beyond it, with shops, temples, a public bath, and private houses. The principal temples are Rameshwar, Mahadeo-ka-Mandar, built by the first Maharaja, Jaswant Singh, and dedicated to Rameshwar Mahadeo or Shiva; Panchwa Maji-ka-Mandar; and lastly two old temples of Barwasan and Jiwan Mata, chiefly attended by Kayasths. Near this gate is an excellent square well—Suraj Kund—which contains sweet water throughout the year. It is surrounded by subterranean rooms, known as "Hamáms," built by Maharaja Sur Singh as cool retreats for the hot months.

In the northern side of the city wall, at its eastern angle, is located the Nagori gate, which resembles the other main

gates in all its details. There are several temples and gardens outside, and Mahamandar, the town of the Naths, is adjacent.

Close to this gate is the seventh entrance to the city, which was closed by Maharaja Abhai Singh in order to strengthen the city against attack. There is a large cremation ground, called Kágá, for Rao Rajas and Sardars, the *chhattris* of which now form a Leper Asylum; there are also Shitla Mata's temple, a garden noted for its pomegranates, a sacred kund, and a well of good water. The thickest part of the city wall, close to this gate, is said to have been built by Maharaja Abhai Singh, and the rest of the wall completed by his younger brother, Maharaja Bakhat Singh, within six or seven months. A strong tower near this gate, and the walls and towers at the Nagori gate, show the marks of cannon-balls left by the besieging armies of Jeypore and Bikanir, who, with Amir Khan and some of the forces of other Rajas, marched on Jodhpore to support Dhonkal Singh, posthumous son of Maharaja Bhim Singh, against Maharaja Man Singh, then on the *gaddi*. During this siege the Bikanir force gained access to, and mounted a gun on, the *Singhoria-ki-Bhakri* (a small hill within the city wall, on the north side, opposite the fort), which was then within their range, and the marks of their shot are still visible on the base of the rock and the door of the small gate of the fort known as "Khandi" or "Lakhna" Pole. However, a skilled Marwara gunner levelled his gun on to that of the enemy and smashed it to pieces, at the same time killing the gunner engaged in loading. This fortunate circumstance was soon followed by further success on the part of the defending army. Amir Khan changed over to their side, and the combined forces of Jeypore and Bikanir were soon driven off with considerable loss and great ignominy.

It is evident, from the configuration of the streets and open spaces, that little attention has been given to laying out the city, and that it has been built up bit by bit without any

Temple, Jodhpore City.

To face page 79.

regard to proper thoroughfares. The streets are therefore narrow and irregular, and, in many quarters, blocked at one end; wheel traffic is consequently difficult in most of them, and impossible in some.

The main street, locally known as "Ooba Bazaar," runs almost due east and west through the city from the Mertia gate. The most important shops are found here, viz., those of perfumers, grocers, Pansaris, cloth-sellers, Halwais, Patwas, shroffs, Kaseras, betel and fresh fruit sellers, hardware goods, shoe-shops, &c.; there are also town residences of many important officials and others; several important temples, viz., Kunjbihariji, Bageliji, and Tija Maji-ka-Mandars, and a very old Darga of Khás-ka-Pir.

"Ada Bazaar," another important street, runs from the Jalori gate across "Ooba Bazaar" to Ranisar and Padamsar tanks, on the west side of the fort. There are numerous shops, temples, an unfinished mosque, and many fine private houses along this route. The post-office, Jaswant hospital for women, the girls' school, first branch dispensary, mint, and Dhánmandi can be entered from this street.

Near Chawriji-ka-Mandar, a temple built by Maji Chawriji, another fairly wide street crosses the main bazaar, and leads from the Sojatia gate to the fort. Several fine private houses with well-carved fronts may be seen along this route.

The above-described principal streets have numerous small streets and lanes opening into them, many of which are very narrow and dark, and all are unpaved, except at places where they pass over high rocky grounds. These lanes in turn branch into others still smaller, thus forming a sort of network throughout the whole city. As most of the thoroughfares are deeply embedded in sand, wheel traffic is not much in use within city limits. Consequently the people ride horses and camels, and bullock-draught is in general use for both carriage people and goods.

The population of the city, as enumerated in 1891, was 61,849, of which 31,706 were males and 30,143 females; and that of the suburbs 18,646. The population is increasing rapidly, especially in the suburbs, as already referred to. Within the city wall the Hindus numbered 42,990, Mahomedans 13,676, Jains 5040, and all others 143. The Oswals are the wealthiest citizens, but some other Mahajans, also Brahmins and Kayasths, are well to do. There are several villages and hamlets around the city, which are chiefly occupied by Malis and low-caste people.

Mahamandar is a small town of the Nathji Maharaj, the descendant of the spiritual guide of Maharaja Man Singh; it contained 577 houses and 2547 souls in 1891; it is the largest suburb of Jodhpore, and is situated less than half a mile outside the Nagori gate in the north-east direction. It is fortified, being enclosed by a thin stone wall, a mile and a quarter in circumference, supported by bastions, and set out with battlements and loopholes for defence. The area is an irregular quadrangle, having a gateway in each of its four sides. There is a well within, that has never been known to become exhausted, and the water of which is celebrated for its sweetness. The Mahamandar, or "the great temple," contains two beautifully carved palaces, one where the Nathji resides, and the other reserved for the spirit of his great ancestor, with a magnificent bed laid out in the principal state chamber, which is said to be regularly used by the celestial.

The city of Jodhpore is on the Jodhpore-Bikanir Railway, which is connected with the Rajputana-Malwa Railway at Marwar junction and Kuchawan road. The railway station of Jodhpore is within a few hundred yards of the city wall, and it is very conveniently placed for traffic through the Jalori and Sojatia gates.

The Jodhpore fort attracts the eye from afar, standing out in great magnificence on an isolated rock, about 400 feet above

Fort, Jodhpore.

To face page 81.

the sandy plains on the east and south. From the top of the palace a good view of the broken range of hills on the west and north, from which the fort rock is detached, can be obtained. The city lies around the base of the rock on three sides, in the form of a horse-shoe, and adds to the picturesque view which may be had from the palace within the fort. The peak on which the fort is built is scarped on all sides, except at the north-east corner, where it is approached by a metalled road. The surrounding wall, which is from 20 to 120 feet high, and from 12 to 70 feet thick, encloses an oblong space about 500 yards in length by 250 in breadth at its widest part. This enclosure is almost completely covered by buildings, viz., palaces, barracks, and magazines. It has two main entrances, one at the north-east corner leading in from the road, the other at the south-west extremity leading up from the city, and between these are other gates and inner walls for purposes of defence. The top of the outer walls on the east and south-east sides has been formed into a wide rampart for working artillery, and on the other sides the walls are surmounted by a complete chain of battlements, with towers here and there to support heavy guns. The palace displays much stone-carving in its arches, windows, balustrades, and balconies, many of which are both elegant and beautiful in design and finish. The masonry is very solid and substantial throughout, the walls of both the fort and palace being of heavy cut stone, well cemented, and sometimes pinned together with iron spikes. To give additional strength to the outer walls, they are in many places strongly buttressed, and the masonry spiked to the rock on which it rests. The fort was built by Rao Jodha, the founder of Jodhpore city, in A.D. 1459, and a man—Rajia Bhambi—was interred alive in its foundations, to invoke good fortune on its defenders and to ensure its impregnability. Rajia's family had some land—Raj bágh—bestowed on them, and they were for ever exempted from pressed labour by the

chief, in consideration of the sacrifice of their ancestor. Rao Maldeo added much to the fort, and Maharaja Abhai Singh still further strengthened it; indeed, most of the chiefs since Jodha have done something to enlarge or renew some part of it. The drainage and sanitation have during recent years been much improved; a force-pump has also been put up by Mr. Home, which raises water from the Ranisar to the top of the palace, and saves the attendants infinite toil in carrying the required supply from below.

There are eight gates, but only two of them communicate directly with the outside, viz., Fateh Pole, the entrance from the city, and Jey Pole, the entrance from the main road.

Fatch Pole, or Gate of Victory.—This gate was built by Maharaja Ajit Singh, in commemoration of his victory over the Moguls in 1707, when, on the death of Aurangzeb, the Rathores expelled many of the Mahomedans from Jodhpore, and killed many more. At this time, Mullâhs and other Mahomedans holding office, having assumed the garb of "Sadhus," left the country in disguise, and Hindus who had been forcibly converted to Mahomedanism returned to their original faith. The gate is approached by a road leading up from one of the main streets of the city, which runs to the Jalore gate in the south wall.

Amriti Pole.—This gate was built by Rao Maldeo to increase the space within the fort.

Jodhaji-ka-Phalsa.—This gate was the extreme limit of Rao Jodha's fort. Sardars have to alight here from their horses or chairs before entering the fort proper, the Maharaja alone remaining mounted in a procession passing through this gate.

Loha Pole.—The front portion of this gate was built by Rao Maldeo, but the gate was not completed till the time of Maharaja Bijai Singh. Munitions of war are kept within this gate, and on its pillars are to be seen the handmarks of many

"Satis." "Satis" ceased after the time of Maharaja Man Singh, on whose funeral pyre six of his widow ladies became sati, and were cremated with him. This gate has recently been much strengthened and enlarged.

Suraj Pole, now called "Mardáni Dori," was built by Maharaja Sur Singh.

Jey Pole.—This gate was built by Maharaja Man Singh in commemoration of his victory over the Jeypore army, whose attack on the fort in A.D. 1809 was repulsed with great loss. The door of this gate was brought from Ahmedabad, during his reign, by the Thakar of Nimaj, from whom Maharaja Man Singh obtained it.

Lakhna or Khandi Pole is a small gate lying close to the Amriti Pole; it was built by Rao Maldeo, and bears marks of the siege of 1809.

Gopal Pole.—It was built by Kiladar Oor Gopal Dass, Thakar of Karno, in the reign of Rao Maldeo.

The fort contains the following palaces, viz.—

Moti Mahal, the most important palace, built by Maharaja Sur Singh, but completed by Maharaja Takhat Singh; it is handsomely decorated with fresco portraits of the ruling family, Hindu plays, and pictures of Hindu deities; its ceiling and pillars are beautifully gilded.

Khabgah-ka-Mahal has been set apart as the sleeping apartment of the chief; it was built by Maharaja Ajit Singh, and some additions and alterations made to it by Maharaja Takhat Singh.

Phool Mahal was built by Maharaja Abhai Singh, but alterations have since been made; it has many artistic decorations on its walls and ceiling, among which are Dassera and hunting scenes.

Fateh Mahal was built by Maharaja Ajit Singh to signalise the retreat of the Mogul army from Jodhpore; the State jewellery is now kept in this apartment.

Takhat Bilas was built by Maharaja Takhat Singh, as its name implies.

Daulat Khana, the abode of wealth, was built by Maharaja Ajit Singh; its ceiling is supported by a number of short massive columns, arranged in parallel rows about 12 feet apart.

Chowkelao Mahal was built by Maharaja Ajit Singh, and additions have since been made.

Sileh Khana.—The armoury, in which many old arms are kept, some of which have been taken in battle, and others from time to time presented by the Paramount Power to the chiefs of Jodhpore. A new Sileh Khana is now under construction.

Kanwar-pade-ka-Mahal was built by Maharaja Takhat Singh for his eldest son, the late Maharaja Jaswant Singh.

Ajit Bilas was built by Maharaja Ajit Singh as a place of residence, but it was afterwards turned into the temple of Murli Manoharji by Maharaja Bijai Singh.

In the *Sabha Mandap Chok*, near the entrance to the "Flower Palace," the marble chair called "Singar Choki" is located on a marble platform. This "Choki" is used for the Raj "*tilak*" ceremony on the accession of a new chief. The ceremony corresponds to the coronation. During this ceremony the new ruler is seated on this marble chair, which is elevated on a marble platform, while the Bagri Thakar puts a "*tika*" or mark of blood or ochre on his forehead, and binds on the sword of office. The new chief then receives the congratulations of his friends and the "*nazars*" of his subjects. The office of applying the "*tika*" and investing the chiefs of Marwar with the sword of office is hereditary, and the ceremony can only be performed by the House of Bagri. This hereditary office dates from the time of Rao Suja of Marwar, and was brought about as follows:—On the occasion of the death of Rao Suja there was a dispute among the Sardars as to which of his grandsons should succeed, and one party found it necessary to hasten the installation; but

Palace, Jodhpore.

To face page 85.

no "*roli*" was available to make the required red mark on the forehead. However, the Bagri Thakar, with great presence of mind, cut his thumb and applied it bleeding to the forehead of the younger prince and then handed him his sword, thereby establishing his candidate in power, to the discomfiture of the elder brother and his party. It is believed that the Bagri Thakar took the side of the younger prince on this occasion, and hastened the "*Rajtilak*" ceremony as an act of revenge on the mother of the elder prince. On a previous occasion this Thakar with his followers, much fatigued and hungry, arrived at the palace at night to inquire after Rao Suja's health. He asked for food, when the lady above referred to replied haughtily that she was not an innkeeper to supply food at that hour; whereas the mother of the younger prince treated the weary travellers hospitably, and afterwards received an ample reward in the succession of her son. The Bagri Thakar holds a large jagir, which he formally gives up on the death of one chief, to be returned to him on the accession of a successor as a reward for the efficient discharge of this ceremony.

The largest and most powerful guns in the fort are *Kilkala* and *Shimbhubán*, brought from Ahmedabad in 1731 by Maharaja Abhai Singh when he was sent there by the Mogul Emperor to suppress the rebellion of Sherbaland, Subadar of Gujerat.

The fort is supplied with water from Rani Ságar, a tank constructed by Rani Hadiji of Rao Jodha for the use of the city, but Rao Maldeo had it enclosed within the fort. The water is lifted to the top of the fort from this tank by a steam force-pump erected a few years ago, and distributed over the buildings by pipes. There are two wells within the fort, one called Patalia, near "Jharná," the depth of which is said to be about 450 feet, and another in Chowkelao, which is believed to be even deeper.

There is a small fortress called Fatehgarhi situated about five hundred paces west of Siwanchi gate, and another named Takhatgarh on Machia Bhákar, built by Maharaja Takhat Singh. There are many forts throughout the State, the principal ones being at Jalore, Nagore, Phalodi, Sojat, and Merta.

SIROHI.

The capital, Sirohi, situated at the western base of the range of hills north of Abu, is twenty-three miles distant from Erinpura, 171 from Ajmere, and contains about 8000 inhabitants. It is naturally well drained and healthy, although hot at certain seasons on account of its being under the hill and having the breezes shut out thereby; it has a good and abundant water supply from both wells and tanks. There is no great trade in Sirohi; the manufacture of sword-blades and knives is the speciality of the place. There are fifteen Jain and four Hindu temples in the town, none of which call for special comment. They are not much resorted to by pilgrims, so they are only of interest from their age and good state of preservation, as they are said to be between five and seven hundred years old. A new temple is now under construction by Her Highness the Maharani. The palace of His Highness the Maharao is substantially built, and has been greatly enlarged during recent years; it is picturesquely situated on the hillside overlooking the town, to which it adds considerable grandeur. About two miles from Sirohi towards Erinpura is the shrine of Sarneshwar, the tutelary deity of the chiefs of the State, located on the slope of the same range of hills as the capital. The temple is built at the site of a *kund* or fountain, said to be efficacious in cutaneous diseases, but resorted to for cure principally by local people, as it has now no wide reputation for healing. There is no architecture worthy of note in the temple, which probably dates from the

Street, Jaisalmir.

To face page 86.

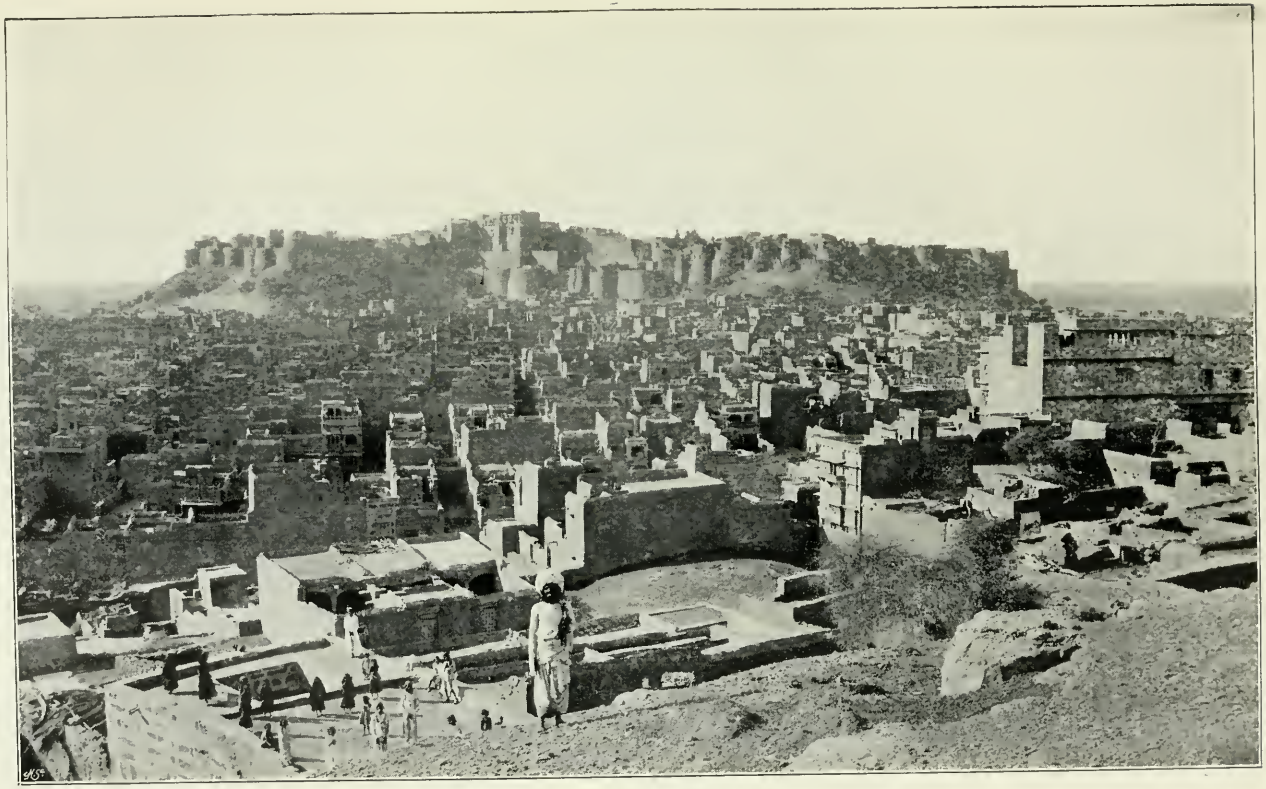
foundation of Sirohi, some five hundred years ago. The temple is dedicated to Shiva and contains the usual phallic emblem. The entrance is guarded by two stone elephants, and outside there is a large trident about 12 feet high, said to be composed of seven metals. The place is surrounded by a fortified wall, built by one of the Mussalman kings of Mandu, who is said to have been cured of a leprous disease called "*korh*" by bathing in the fountain. On the plain below the temple are the cenotaphs of the former chiefs of Sirohi, none of which display anything extraordinary in architectural beauty.

JAISALMIR.

The capital city of Jaisalmir, founded by Rao Jai Sal in A.D. 1156, lies between lat. 26° 56′, long. 70° 58′, and contains about 3400 houses, with a population of about 13,000 souls. It has a substantially-built stone wall around it, about three miles long, 10 to 15 feet high, and 5 to 7 feet thick, supported by bastions and corner towers, and includes the fort, which occupies a hill on the south-west side. There are two main entrances to the city of Jaisalmir, viz., the Amarságar gate, leading from the west, and the Garrisar gate, leading from the east. These gates are strongly built of blocks of cut stone, cemented together with lime and arched overhead; they have recesses for a guard on either side, and a metalled and paved road passes through them from one end of the city to the other, which is the main street of the city. This street is fairly wide at most parts, and near the custom-house it opens out into an irregular space which is the principal market of Jaisalmir. At this spot there is some little appearance of traffic, as well as in one or two contiguous streets, but there is little of the bustle of a large city in any part of it, except perhaps about the time of lamp-lighting, or again at those times when the women of the city stream out by hundreds

to fill their pitchers, morning and evening, with the water of a large tank called Garrisar. The main street passes the entrance to the fort, and many of the secondary streets open into it in an irregular way. The other streets of the city are mostly narrow and dusty passages between rows of houses, and they are narrowest where some of the finest houses stand, the well-to-do having been able to encroach on them when they rebuilt and improved their houses. Two gates of less importance than those mentioned, viz., Kishenghat-ka-Pole and Malka Pole, look towards the east and north, and are away from the main thoroughfare.

The houses are all substantially built of stone and mortar, and flat-roofed. Most of them have beautifully carved fronts, to which the yellow marble of the hills in and around Jaisalmir lends itself, as it is easily chiselled when first quarried, and becomes harder on exposure. Some of the houses of the Seths have such beautifully carved fronts, that it is at first sight difficult to realise that the work is in stone. Nearly every house of any importance in the city has a carved balcony, balustrade, or latticed window, and ornamented porches and columns supporting ornamented projections of stone are very common. The house of the notorious Dewán Salem Singh, who devastated the country nearly a hundred years ago with his extortion and cruelty, is magnificently carved, and towers above the rest of the city ; it is a very grand edifice of six storeys of cut stone, with cupolas and much ornamentation, especially on the top storey. Nath Mal, the late Dewán, during his time of office, built himself a fine house, on the front of which much beautiful carving is displayed. The late Maharawal, Bairi Sal, built a new palace and erected a carved edifice on it in the form of a watch-tower, which displays some of the finest workmanship of Jaisalmir in stone. A new house for the present Maharawal is approaching completion; it is built of the yellow marble of the place, having its windows and *chhattris* hand-



Fort, Jaisalmir.

To face page 88.

somely carved and of beautiful design; when completed, it will add to the architectural beauty of the place. Around the city are many fine houses and *chhattris* of the same yellow stone, minutely worked into a great variety of designs.

The streets and roads in and around the city have recently been greatly improved, and the water supply has been much increased by enlarging and deepening the tanks, which should now, when properly filled, contain a two years' supply. In the fort there are some good wells, which are said never to fail, although their water deteriorates somewhat after consecutive years of little or no rain.

The fort stands on a hill which overlooks the town from the south. This hill runs almost from south to north. It is about 250 feet above the surrounding country, and about 500 yards long by 250 wide at its greatest diameter. It is entirely covered by buildings and defences, and the base is surrounded by a buttress wall of solid blocks of stone, partly embedded in earth, about fifteen feet high, and above which the hill projects and supports the ramparts, which form a double line of defence. The bastions are in the form of half towers, surmounted by high turrets and joined by short thick walls; the towers, turrets, and joining walls support battlements, those of the towers being continued along the joining walls and forming a complete chain of defence, about thirty feet above the hill. The turrets, which form the second line of defence, are about fifteen feet above the towers on which they are supported. The fort is approached by one entrance on the town side, which has four gates, viz., Akhai Pole, Ganesh Pole or Suraj Pole, Bhuta Pole, and Hawa Pole.

The first gate, or Akhai Pole, encloses a small irregular space in front of the main entrance to the citadel. It was built long after the fort, and is merely a strong corbelled arch (with recesses for a guard), in which no artistic beauty or grandeur is displayed.

The Suraj or Ganesh Pole is the main entrance to the fort. It is a massive corbel of solid blocks and beams of stone, pinned and cemented together, with guardhouses on either side and on the top. Fine towers command the approach to it.

The Bhuta Pole is a fine massive entrance, built of large blocks of stone, and surmounted by a building which displays much carving and artistic beauty.

The Hawa Pole is a massive gateway, surmounted by the palace, the lattices and porches of which are handsomely carved and designed.

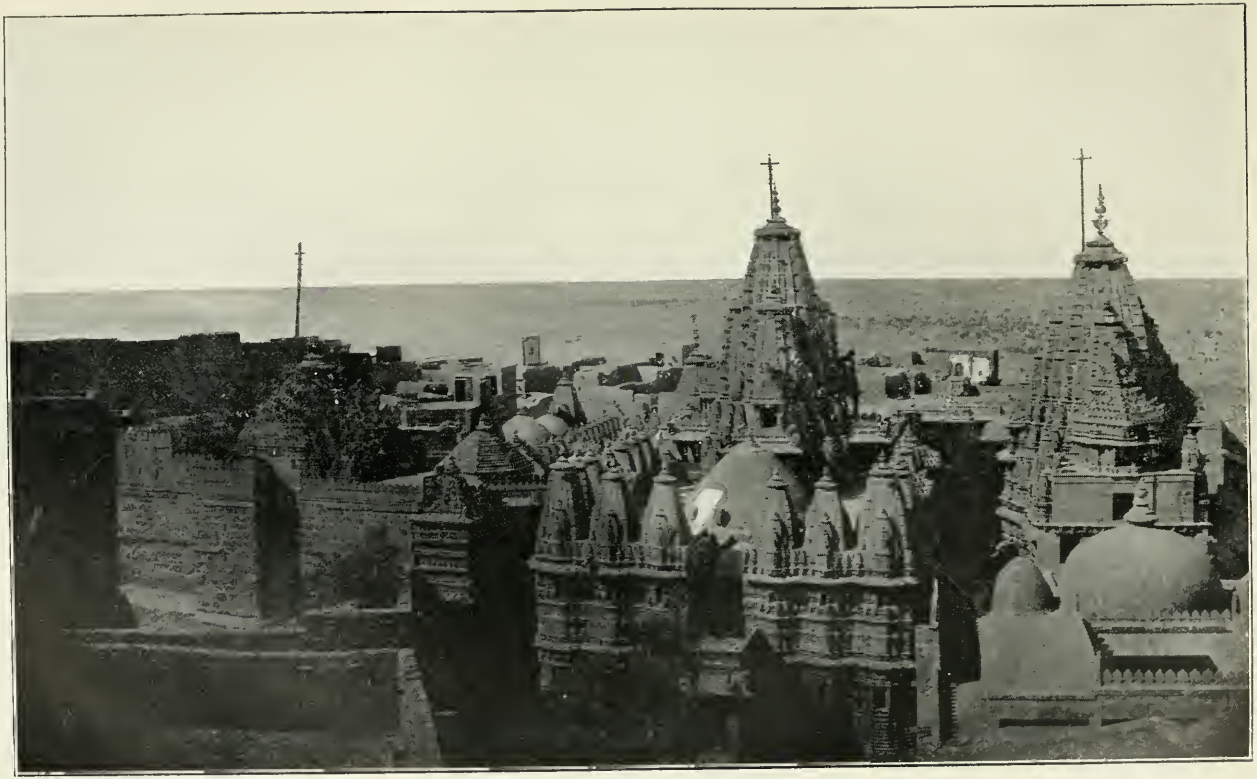
There are four Vishnu and eight beautifully carved Jain temples within the fort. They greatly resemble those at Mount Abu, but the columns and figures are of yellow instead of white marble. The carved pillars, arches, and figures are very elaborate, and many of the designs are very tasteful, and so varied that they baffle description. The Jaisalmir stone lends itself to this kind of sculpture, and the stone-carvers, even of the present day, are celebrated for their finished and handsome work. The prospect from the rampart is not attractive. The foreground presents a succession of sterile rock-bound ridges, barely clad with a few stunted bushes; whilst on the horizon the low undulations seem to mark the commencement of the still more arid desert and sandhills.

The fort also contains about 700 houses of Brahmins within its precincts, and derives its water supply from three or four sweet wells.

Lodorva, ten miles north-west from Jaisalmir, was for a time the capital city of the Bhátis, but it is now in ruins. There is, however, an ancient Jain temple still standing.

Tánot, founded in A.D. 731 by Rao Keharji, was the first seat of power of the Jadu Rajputs on their settlement in the desert.

The principal forts in the State are those of Kishengarh, Ghotaru, Bikampur, and Nochna; whilst those of Baisalpur, Deora, Lathi, and Shahgarh are of less note.



Temples, Jaisalmir.

To face page 90.

RELIGIONS, SUPERSTITIONS, AND OMENS

The Hindus of these States are much given to observances dictated by Brahmins; they are essentially a religious people, and very tolerant of other sects, giving freely to the support of their own temples and caste institutions, and having no desire to make converts. Even Mahomedans brought up here have lost much of their fanaticism by contact with the tolerant Hindus of the country, and they observe some of the Hindu customs, attend some of the Hindu fairs, and join regularly in the Dassera procession.

Vishnu, Shiva, and Shakti (corresponding with Jupiter, Mars, and Bellona) are the principal deities of the Rajputs, and many of the other Hindus of these States. Most of the innumerable Hindu deities receive some attention, besides many local saints who are worshipped on certain occasions, such as Ramdeo, Mallinath, and Pabu.

The Kaimkhanis, a numerous sect of Rajput origin, who were forcibly converted to Mahomedanism during the Mogul Empire, still retain many of their Rajput customs and Hindu observances, which they combine with Mahomedanism.

Hindus of these States give much in charity, and ascetics are liberally supported. Some of them beg in towns and villages, others reside in monasteries, caves, and places of seclusion, where they are fed by the women and children. These ascetics are very numerous, and their maintenance must be a great tax on the people; besides, most of the Srimali and many other Brahmins live on charity. There are hundreds

of Brahmins in Jodhpore city, well clothed, well fed, and possessing much jewellery and money, who have no other means of livelihood than begging. Chárans have much free land, and get great support from the landed aristocracy, in praise of whom they compile histories and make odes. Even the lowest caste beggar is rarely turned away from the door without a dole. The liberality to beggars of the dealing classes, who are unusually hard in their mercantile transactions, is very striking.

Most of the Sadhus or ascetics, who reside in the secluded corners of the hills about Jodhpore and throughout these States, lay claims to superior knowledge of the occult in medicine, astronomy, prophecy, &c. They all profess great piety and self-denial. Many of them can perform great feats of endurance, some never requiring to sleep in the recumbent position, others being able to withstand all weathers without clothes, lie on sharp points, perform long journeys without food or water, and a few, though endowed with speech, never making use of the faculty, but communicating by signs. Most of them claim some power over evil spirits, and to be able to bring about a change in destiny by intercession with the gods for those whom they may consider worthy of it. Some of the people have much faith in these ascetics, and consult them on all important occasions; they also obtain remedies for disease from them, and invoke their blessings on their children, themselves, and their property. In some of the monasteries the ascetics sing at certain times, when the people attend and make offerings; other inferior ascetics sing at the doors of the houses, in the towns and villages, where they wait the dole of flour or grain by which they fill their bags. The curse of the ascetic is much dreaded, while his blessing is much courted.

The superstitions of the people are numerous and deeply rooted; they take many of their omens for good or bad luck from birds, beasts, and dreams.

It is considered unlucky to meet a stingy man in the early morning, and there are many individuals of this class whose names would not be mentioned by villagers before breakfast, lest misfortune or ill-luck should follow. Many of the people believe that the evil eye is very powerful to do injury to those on whom it is fixed, and that evil spirits *can be* swallowed accidentally while yawning. However, snapping the fingers prevents this misfortune, and retainers of great men, who have no other duties to perform, justify their being kept in employment by performing the finger-snapping, when their master yawns in his fits of ennui.

The sáras or crane is considered a bird of good omen when met with on the left, flapping its wings. The brown dove is considered a very ominous bird, and if it breed in the house, it is unlucky for the owner. If the young dove sit on a person's head, the person will die within six months, and any object occupied by it for the first time will also be destroyed within that period. The cooing of the white dove is auspicious. The black robin, which builds its nest of twigs, grass, &c., can indicate famine by a predominance of grass over other materials in the nest; if its nest be high, the *bájra* will be long, if near the ground, short. The peacock, passing the traveller on the left, is a good omen. The blue jay is a bird of very good omen, if seen when starting on any business or project. The owl is generally a bird of bad omen, and it brings death and calamity to the house on which it sits. The partridge, calling on the right, when proceeding on any project, indicates success; and on the left when returning, it is an assurance of the continuation of good luck. The "Roopa rail" is regarded as a bird of good omen; if seen flying with food in its mouth on the left, while going on any project, and on the right when returning, success is assured. When about to undertake a journey, if the kite scream on the left, success is assured. The small owl screaming on the right indicates

success; on the left, disaster. The tree-magpie is the lucky bird of Shikaris, and if it appear, sport is certain.

The monkey crossing the path from right to left is auspicious, and the same is believed of the deer; but if they cross from the opposite direction, they indicate failure. The howling of the jackal on the left is a good omen. The hedgehog on the left is indicative of good. A cat crossing the path from any direction indicates disaster, unless the name of Raja Ramchandar is invoked. A dog flapping his ears is a bad omen, but the fox and hare crossing from left to right are good. The bellowing of a bull and the braying of an ass on the left are good. The wolf and hyæna crossing from left to right are very unlucky.

To see a cart loaded with grain, or fire in the hand, is inauspicious for commencing a journey. A female gardener, with a basket of green vegetables on her head, is a good omen. The arrival of a guest on *Akhatij* is considered a very good omen. It is very unlucky to meet a goldsmith, unless the chest be beaten at the first sight. To meet a funeral without mourners is auspicious, but a cart full of corn and a *ghara* full of ghee, flour, or fuel are inauspicious. To meet a woman with a *ghara* of water is a good omen, also a woman with her child on her arm, unless she be a widow; but to meet a woman with dishevelled hair is unlucky. A Brahmin, with *tilak* on his forehead, and a Rajput with a sword on his shoulder, are very good omens. A widow is always inauspicious, but women who are ornamented and have husbands are auspicious to meet. Sneezing before undertaking any project is unlucky, but a sneezing person behind is lucky. Three men going on the same errand together cannot have success.

Dreaming of camel-riding is inauspicious and a laughing dream is unlucky, while weeping in dreams is a good omen. Dreaming of gold, copper, and iron is inauspicious, but of silver and sweetmeats auspicious; however, eating the latter

in dreams indicates misfortune. Dreaming of a beautifully dressed woman is very auspicious, but if she appear to sing, it denotes misfortune. Dreams of flying in the sky and of elephants are indications of prosperity; but to dream of snake-bite, fire, or water is bad.

MARWARI PROVERBS

1. Ani chuka bisa ho = A moment once lost is lost for ever.

2. Aj aman ne kal taman = To-day me, to-morrow thee.

3. Ap aprai ghar men sara Thákar hai = Every one is lord in his own house.

4. Utawla so bawla = A rash man is no better than a mad man.

5. Ek bar thagayán sains budh awe = Once cheated, ever watchful.

6. Ochhi ojri men bat nahin pachai = A little pot is soon hot.

7. Kunbar kunbari sun bas nahin awai jarai gadheri ra kan khainchai = Since the potter dare not pull his wife's ear he pulls the donkey's.

8. Andhero tanduro Ramdeoji bajawai = God guides the blind.

9. Andhan men kano Rao = A one-eyed man is a chief among the blind.

10. Karola so pawola ne bavola so lunola = You will be done to as you will do, and as you will sow so you will reap.

11. Kal sun howai jiko bal sun nahin howai = Tact prevails where strength fails.

12. Kai batawan sun kar batawano batto howai = Deeds are better than words.

13. Kothai howai jiko hotai ai rawai = What is in the mind will be on the lips.

14. Khad khinai jinai kuo tayar = One who digs a pit for others finds a trap ready for himself.

15. Gugaryan ra gothia ne khay pi ne uthya = When money is lacking friends will be packing.

16. Ghar men howai nana to bind parnijai káná = A bride will not object to marry a one-eyed man so long as he is rich.

17 Chuttar nai samjawno soro ne murakh nai marno soro = A nod for the wise, a rod for a fool.

18. Chhotai mundai moti bat = Small mouth, big talk.

19. Thotho chino bajai gano = An empty vessel makes much noise.

20. Dupti dekhnai pag pasaro = Cut your coat according to your cloth.

21. Pet papi hai = The stomach teaches all arts.

22. Bina man-ka pawna ghee ghalun kai tel = Uninvited guests seldom meet welcome.

23. Jin-ri lathi unri bhens = The man with the stick can make the buffalo leave his way (might is right).

24. Sanch nai kadai ne lagai anch = Truth seeks no hiding corner.

Couplets

1. Bajrika sográ mothan ki dár
   Akre ki jhonpri phogan ki bar
   Dekhi Raja Man Singh teri Marwar =

"Bread of *bajra* flour and *dal* of *moth*, huts of *akra* with fences of fog, O Raja Man Singh, such is your Marwar."

2. Hitmen chitmen hathmen khatmen matmen khot
   Dilmen darsawai daya páp liyán sir pot =

"His (the Bania's, the dealer's) friendship, his mind, his dealings, his bonds, his principles, are all full of deceit. He pretends to be merciful, but is a great sinner."

3. Pahle pet ne pache Seth
   Pahle Raj ne pache Biaj =

"From a ryot's earning he means first to provide his own livelihood and then the claims of the Bohra (lender), but he finds the Raj demand is first to be met, and then the interest."

SIGHTS WORTH SEEING

The Fort.—In the city the central and first object of interest is the fort, which has already been fully described.

Besides the fort there are many other objects of interest within the city, viz., old temples, palaces, and buildings, with handsomely carved sandstone fronts, some of which will now be particularised. The following are the principal ones:—

Gangshamji-ka-Mandar, the chief temple in the city, was built by Maharaja Bijai Singh, but the idol of Shamji placed in it was brought here by Rao Ganga from Sirohi on the occasion of his marriage there with Rani Deoriji. He placed it in an old temple (built by himself), which is now known as Ghunshamji-ka-Mandar or Panchdevria-ka-Mandar. Maharaja Bijai Singh removed this idol to his own temple, which in this way came to be called, after Rao Ganga, "Gangshamji-ka-Mandar."

Kunjbihariji-ka-Mandar, the best carved and finest temple in Jodhpore, was built by Gulabrajji (of Maharaja Bijai Singh's time), who also built the Gulab Sagar tank, the Girdikote, and Mailábágh, which is now the Hewson Hospital.

Temples of Balkrishnji, Dauji, Mahaprabhuji, and Madan Mohanji are of Maharaja Bijai Singh's period. These temples belong to the Ballabhcharaya sect, the chief devotee of which was the Maharaja himself.

Tiji Máji-ka-Mandar was built by Maji Tija Bhitianiji, widow of Maharaja Man Singh.

Two fine temples, known as Bagheliji-ka-Mandars, were built by the Bagheli Ránis.

There are two very old temples, one dedicated to Chawandá

Mataji and the other to Juwála Mukhiji, situated close to each other, on the south-west extremity of the rock on which the fort is built. The Chawandá Matá or Devi, a female deity, is worshipped by the rulers of Marwar, and a buffalo is annually sacrificed at this temple on the Dassera festival, and also goats on other important occasions. In A.D. 1857, on Nagpanchmi fair, after midnight, lightning struck the fort magazines, which lie some feet below this temple, near Chiriya Nathji-ka-Paglya under the fort rock on its west side, and caused an explosion which blew up the roof of Chawandá Matá-ka-Mandar, and did great damage to life and property.

Chirianathji was a famous ascetic, who lived before the foundation of the city and fort of Jodhpore, in a small cave of this rock, which was then known as "Chiria Bhákar." The place is still known as "Chirianathji-ka-Paglya," meaning foot-prints engraved on a marble slab. Before Rao Jodha changed his capital, he examined several hills around Mandore, and at one time intended to lay the foundation of the fort on the Masuria-ka-Bhákar, which is well situated and high. The famous ascetic, however, advised him to build where the fort now stands, and assured him that it would be impregnable. While acting on his advice, Rao Jodha thought it proper to remove the ascetic to some other place; so he sent his men to do so; whereupon the ascetic collected his *dhooni* (lighted sticks), placed them in his cloth, which they did not burn, and went away cursing and declaiming that "no water would be procurable in the country." When Rao Jodha was informed of the ascetic's miracle and curse, he followed him to Palasni, a distance of eighteen miles, where he had the curse reduced to "a severe drought on the land every third year," which is held by many to account for the diminished rainfall of Marwar up to the present time.

Jawalaji, literally "huge fire," is a form of Devi or Mátá, chiefly worshipped by the Kayasth community.

Achleshwar Mahadeo-ka-Mandar is one of the oldest temples, dedicated to Achleshwar Mahadeo, a form of Shiva. In its compound there is a large Baori, built by Rao Gángá.

Nij Mandar, overlooking Gulab Sagar, Udai Mandar, and Maha Mandar, all of which were built during the reign of Maharaja Man Singh, are the principal temples belonging to Náths.

Rama-nund-Kote, overlooking Fateh Sagar, contains temples and a garden of the late Dewan.

There are two chief palaces in the city, viz., Taleti-ka-Mahal, built by Maharaja Sur Sing, and Raj Mahal. The latter, built by Maharaja Takhat Singh, overlooks Gulab Sagar, and was his favourite residence within the city.

The largest Haweli in the city contains above two hundred rooms, many of which have handsomely carved ceilings, balconies, and columns; it belongs to Byas Bheron Das, the court Guru, and it stands at the junction of the streets leading to the Sur Sagar and Padam Sagar.

Mandore, named after Mandu Rishi, is the ancient capital of the Rathores. It was taken by Rao Chonda about A.D. 1395 from the Parihar Rajputs of the Eenda clan. It is about five miles north of Jodhpore city. Most of the old city has crumbled away, but there are still some occupied houses in good repair, and the principal burning-ground is surrounded by many fine Dewals to mark the place. Most of the fort wall is level with the ground, but there remains still in good preservation an old gateway the arch of which has recently been repaired. A nice garden has recently been laid out, and an old palace turned into the Rajput Elgin school. A streamlet named "Nagadari," across which a dam has recently been erected for bathing purposes, flows close to the site of the old capital.

Visitors to Mandore will view with interest the grand specimens of sculptural art in the "Hall of Heroes," of which

Temples, Jodhpore City.

To face page 100.

a very brief account is given below. These figures have been carved in sandstone and covered with polished marble plaster:—

(1) *Cháwandaji*—Goddess of the ruling family.

(2) *Bhaisa surji*—A Hindu goddess famous in war.

(3) *Gusainji*—A high priest, still represented at Chopasni, where he has a temple, village, and free lands. No animal life is allowed to be taken in Chopasni, and meat is not eaten in the village. The Gusainji is said to bathe in cold water twelve to twenty-four times a day; and his daughters are not allowed to leave the family after marriage, the sons-in-law being provided for by the Gusainji. I was asked to see an aged and moribund Gosainji of Chopasni, but I was only allowed to look at him across a wall, and was told not to feel his pulse or examine him, and that he was so holy that he could not take anything prescribed, nor could he even apply medicines locally. I therefore left, stating my regret at being unable to work miracles, and the patient died unrelieved after a short time.

(4) *Mállináthji*—The founder of the house of Mallani, in whose honour the Mallani fair is annually held, continues to be worshipped as a saint by his descendants and other Hindus of the country. There is a local legend that he did not die, but departed from this world on horseback, and that his wife Rupa was also taken up to heaven from her carriage, while on her way to commit *sati* after her husband's disappearance.

(5) *Pabuji*—A Rathore hero whose memory is still held in great esteem on account of his having brought the camel into general use; he was also a great protector of cows.

(6) *Ramdeoji*—A distinguished Rajput hero and a truthful man, who is said never to have told a lie; he took *samadi* (interred himself alive) in A.D. 1458, and still has worship done to his memory.

(7) *Herbuji*—A favourite of Rao Jodhaji, and a saint.

(8) *Gogaji*—A very charitable man. When Feroz Shah invaded his town in A.D. 1296, he fought gallantly and was killed on the field of battle.

(9) *Mehaji*—A warrior of local repute, of whom the Charans still chant.

(10) *Brahmaji*—Brahma.

(11) *Surajji*—The sun.

(12) *Ram Chandarji*—Rama.

(13) *Kanaiyaji*—Krishna.

(14) *Mahadeoji*—Shiva.

(15) *Nathji*—Jalandhar Nathji, an ascetic, one of whose successors was Deonath, the founder of Mahamandar and an absolute pope in the reign of Maharaja Man Singh, who would have made over the entire State to him if he had not been prevented from doing so. In the Mahamandar palace there is still a sacred bed to which the spirit of the great departed Nathji is said to return regularly to take rest. The present representative of the Nathji of Mahamandar has a considerable income from villages and lands, but both his temporal and spiritual authority have steadily waned from the time of Maharaja Man Singh, until they are now of no consequence.

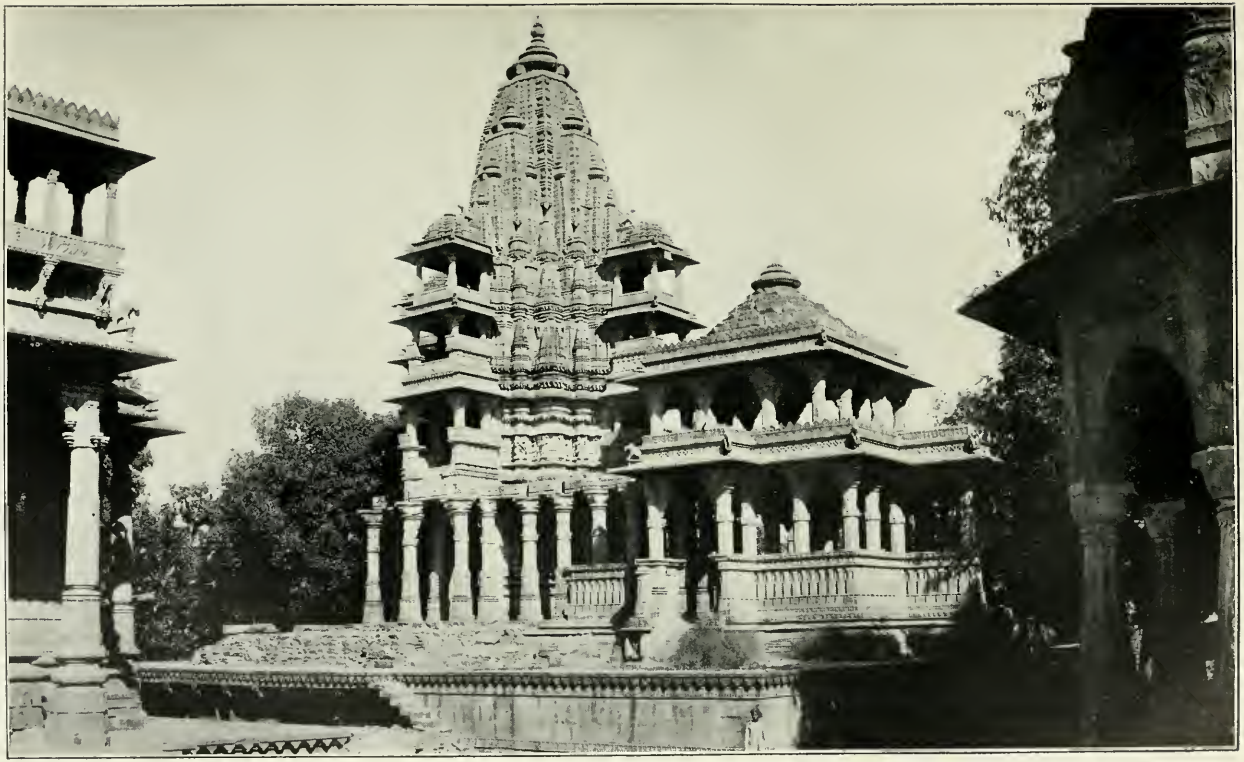
The cenotaphs to the memory of the former rulers of the country are also objects of great interest to visitors. The principal ones are :—

(*a.*) *Rao Maldeo-ka-Dewal*—This Dewal is near the Baori in the south of the burning-ground. Rao Maldeoji died in A.D. 1562, and his monument was erected by Mota Raja Udai Singh in A.D. 1591.

(*b.*) *Mota-Raja-Udai Singh-ka-Dewal* was built by Raja Sur Singh in A.D. 1611. The Mota Raja died in A.D. 1594.

(*c.*) *Sawai Raja Sur Singh-ka-Dewal* was built by Raja Gaj Singh in A.D, 1622. Sawai Raja Sur Singh died in A.D. 1619.

(*d.*) *Raja Gaj Singh-ka-Dewal* was built by Maharaja Jaswant Singh I. in 1649. Raja Gaj Singh died in A.D. 1638.



Maharaja Ajit Singh's Monument or Chattri, Mandore.

To face page 102.

(*e.*) *Maharaja Jaswant Singhji-ka-Dewal.*—Maharaja Jaswant Singhji died at Jamrood in Pesháwar in A.D. 1678. Maharaja Jaswant Singhji was a great soldier, and fought for Shah Jehan in the Deccan. On his return from the Deccan he was given the title of Maharaja in 1653, and, although Aurangzeb distrusted and disliked him, he was so powerful in his time that he was made Subadar of Gujerat and sent again to the Deccan, and afterwards to Kabul to fight. He finally died at Jamrood in A.D. 1678, having lost his three sons: one at Delhi from poison, administered at court, and two at Kabul from the severity of the climate. The cenotaph to his memory was erected by Maharaja Ajit Singh in A.D. 1720.

(*f.*) *Maharaja Ajit Singh-ka-Dewal* was commenced by Maharaja Abhai Singh but was not completed during his reign; it was finished by Maharaja Bhim Singh in A.D. 1797. This is the most imposing of all the Dewals; it possesses much boldness of design, as well as great architectural grace and beauty. Maharaja Ajit Singh died in A.D. 1724.

(*g.*) *Maharaja Takhat Singh-ka-Tharra.*—This monument was built by the late Maharaja Jaswant Singh, G.C.S.I., in A.D. 1875. Maharaja Takhat Singh died in A.D. 1873, and the *chhattri* will be completed by his grandson, the present Maharaja.

(*h.*) The late Maharaja Jaswant Singhji was cremated at Deokund, near the fort, instead of at Mandore; the place is more convenient and the site is better for monuments, on account of its elevation and proximity to the fort and city. Maharaja Jaswant Singh died on the 11th of October 1895.

Kailana.—A tank in the hills and the Shikarkhana of Jodhpore. Pig abound here, but on account of the rough sandstone hills which surround the tank, they readily escape from their pursuers and multiply to replenish the plains below, where they wander in search of food, and give the hunter frequent opportunities for good sport. The bund of

this tank has lately been raised, and its depth is now 64 feet. There is an old palace on a bund which is now often submerged, and a garden with fine trees adjacent. This is one of the principal reservoirs outside Jodhpore.

Sursagar.—It lies to the west of the city, about a mile from the Chand Pole gate. The British Residency was formerly located here. The tank has not held water for many years, since the sandstone rock on which the bund rests was fissured by an earthquake. The old Residency and Residency Surgeon's house were originally built by Maharaja Sur Singh as his special palace. There are gardens with some fine trees and pleasure grounds attached to these buildings, which are now used as a Sardar school.

Balsamand ("the child of the sea") owes its name to Parihar Bálak Rao, who had it constructed in A.D. 1159, and is a fine artificial lake about three miles from the city, on the way to Mandore. Maharaja Sur Singh enlarged the first bund of this tank and built a palace on it, which has since been enlarged. During the reign of the late Maharaja, Mr. Home raised the dam 15 feet, giving the tank a capacity of 56,000,000 of cubic feet; it is nearly 40 feet deep, and supplies the city with water through a canal running into the Gulab Sagar and Fateh Sagar tanks. The railway and the bungalows in that direction are also supplied with water from this tank.

About two and a half miles west of the city is an old garden attached to a small tank called *Akherajji-ka-Talao*, which was built by Singhi Akheraj, one of the chief State officials in the reign of Maharaja Man Singh; this garden is resorted to by city people on holidays.

Jodhpore Abu, a hill known as Bara Bhakar, the highest peak of the sandstone range adjacent to Jodhpore, where the Darbar has built two fine bungalows, and from which there is a commanding view of the country, is approached from

Jubilee Offices and Courts, Jodhpore.

To face page 105.

two directions by a semicircular metalled road, which passes through picturesque valleys laid out as gardens, and stocked with fruit and other trees. Several small tanks can be seen in the monsoon season from this elevation, and many watered nooks in depressions in the hills are always visible, with temples, gardens, and trees cultivated for their shade by the numerous ascetics, who live in secluded corners and subsist on the charity of the city.

Bijolai, a small tank not far from Jodhpore Abu, was one of the favourite residences of Maharaja Takhat Singh, who built a palace there, where the natural scenery is picturesque.

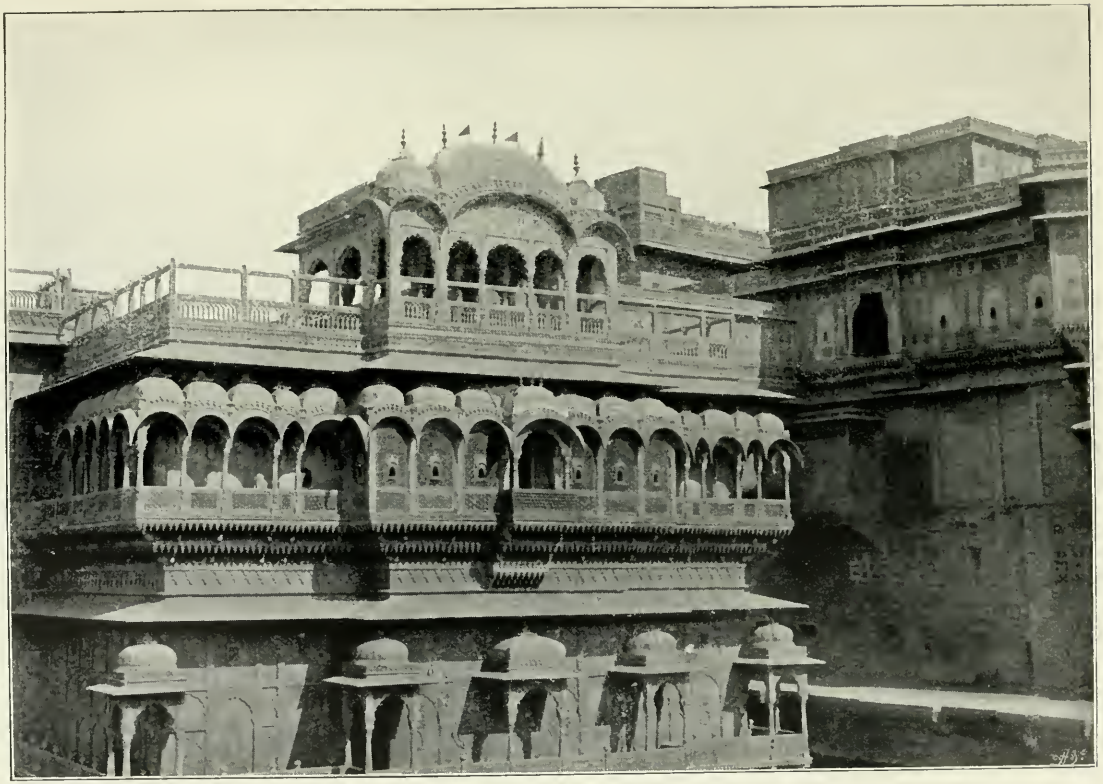
The Ráikabágh and the palace of the late Maharaja, with its hundreds of stables, are very interesting. The Public Offices, built by Mr. Home in 1886–90 from Colonel Jacob's design, are very handsome, and beautifully finished in every detail of workmanship. The Maharaja's new palace, lighted by electricity, the Residency, and other official bungalows, designed and constructed by Mr. Home, are all fine buildings and add considerably to the appearance of the suburbs of Jodhpore. The Cavalry lines, the Sir Pratap School, the Post-Office, the Railway employés lines, the Dák bungalow, the Railway Station, and many of the private houses in the suburbs are good specimens of the solid work which is now being done in Jodhpore. Adjacent to the Dák bungalow is a handsome Serai which adds to the appearance of that quarter, and the cost of which has been defrayed by the Dowager Maharani Jarechiji. The numerous new aqueducts, leading from all directions towards the capital, are specially interesting to those long resident in the desert who are able to thoroughly appreciate a good water supply.

In and around Jodhpore there are many other temples and houses on which are displayed much architectural beauty and artistic design in general structure and the finish of their arches, doors, and balconies. The sandstone on which the

city rests is easily quarried and carved into stately columns and beautiful façades. This has been taken advantage of by builders from the earliest period in the history of this capital of the desert, and the effect has been excellent.

Jaisalmir is well worth a visit to those who do not fear the discomforts of desert travelling; and the sights most worth seeing in and about the city are the fine stone carved palaces and houses; the fort, and the beautifully carved temples within it, some of which rival those of Mount Abu; Bari, where the handsome *chhattris* of chiefs stand, Maharawal Gaj Singh's and the late Maharawal Bairi Sal's being the finest; Amar Sagar and Mool Sagar, where there are gardens and palaces.

The capital of Sirohi is picturesquely situated in the hills, and the palace, which commands the town, is fine and handsome; some of the temples are worth seeing, as they are of great antiquity.



Palace, Jaisalmir.

To face page 100.

RECREATION

Jodhpore.—In Marwar horse exercise is taken by almost every one who can afford to keep a horse, and the Rathore is an accomplished horseman, whether born in the palace or in the village. He, like the Arab of the desert, loves his horse, and will stint himself to feed his steed. Polo is much played at the capital, where there are several good polo-grounds, made at considerable cost, regardless of the floating sands. There are also six or seven racecourses around Jodhpore city, and these are in daily use to keep both horses and riders in condition.

Cricket is also in much favour, and schoolboys can be seen practising in various places on the sand; there is a cricket-ground at the palace, and His Highness the Maharaja Sardar Singh is a proficient at this game, as at polo. Rackets, football, tennis, billiards, and golf are all played at Jodhpore.

Most of the Rathores are keen on guns and field-sports, when they can afford to shoot and hunt. They all take readily to games, whether of the East or West, and this makes them particularly companionable and friendly.

The ordinary Indian outdoor games are much played by the boys and young men throughout the country, viz., "Márdari," "Miyán-ki-ghori," "Kabdi," "Thia Dari," "Jel Dari," "Sotá Dari," "Kundalo Dari," "Bheron Doto," "Dota Dari" (English game of hockey), "Dhunna," and "Guli Danda."

Sirohi.—Cricket is played at the Sirohi capital, and His Highness the Maharao Kesri Singh, K.C.S.I., is fond of his gun. Many of the upper classes in Sirohi State are keen horsemen,

and horse exercises are in great favour throughout the country. Indian outdoor games are keenly contested, both at the capital of Sirohi and throughout the State, viz., "Báthal Kundá," "Ankh Chhipáni," "Lattu-ká-Khel," "Miyan-Kighori," "Guli Danda," "Kabdi," and "Tangri-ká-Khel."

JAISALMIR.—The camel is the most favoured animal in Jaisalmir, on account of its endurance. It is ridden for pleasure as well as to accomplish journeys, and camel-racing is often resorted to as a pastime by the people of the country. His Highness the Maharawal and his brother, who are now at the Mayo College, Ajmere, have been taught cricket and polo, and these games will no doubt be introduced into the far desert very shortly, to supplement the ordinary games of the country, which are at present played with considerable zest.

Colonel Maharaj Sir Pratap Singh, G.C.S.I.
Imperial Service Cavalry Uniform.

To face page 109.

IMPERIAL SERVICE TROOPS

(1) These troops, which consist of two regiments of cavalry, are locally known as the Sardar Risala, and were commenced to be raised in 1889.

(2) The progress has been steady throughout. One regiment was at first raised, then the Jodha and Kaimkháni squadrons of the second regiment, and finally the two regiments, each consisting of 600 sowars, were completed.

(3) In both regiments there are—

Squadron officers	8
Risaldars	16
Jamadars	16
Kote Daffadars	16
Daffadars	96
Sowars	1058
Total	1210

(4) The division of squadrons is by clans.

Clans.	Squadrons of 1st Regiment.	Squadrons of 2nd Regiment.
Jodhas[1]	1st.	1st.
Khichis	4th.	4th.
Mertias[1]	2nd.	3rd.
Gogades[1]	3rd.	1st.
Kaimkhanis	...	2nd.

They are all inhabitants of Marwar.

(5) Out of a total of 1200 horses, 779 are Arabs, 98

[1] Rathores.

Walers, and 322 country-bred, which give a percentage of 64.93 Arabs, 8.22 Walers, 26.84 country-bred, and .01 English bred.

(6) The lines consist of small rooms with verandahs, and the horses stand picketed in front of each man's quarters.

The pay of officers, non-commissioned officers, and men is as follows:—

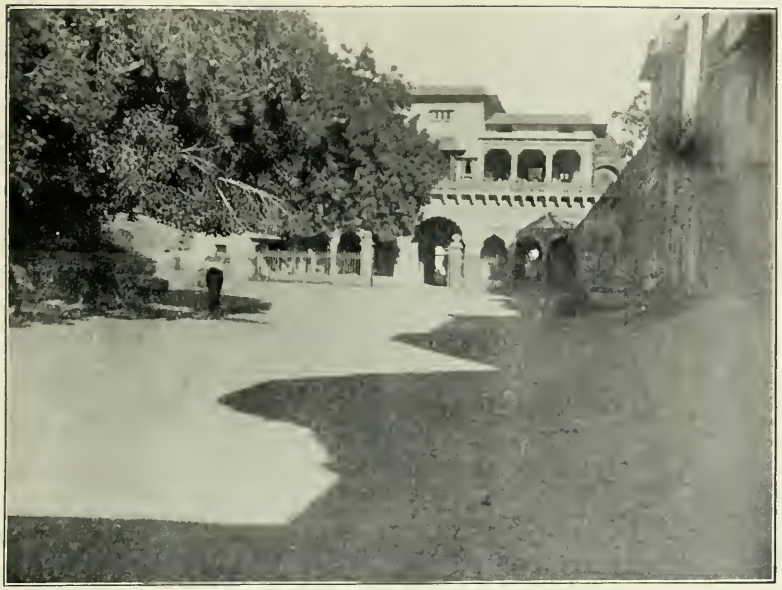
Squadron officers, Rs.250 per month.
Risaldars, Rs.80, 90, 100, and 125.
Jamadars, Rs.70, 65, and 60.
Kote Daffadars, Rs.44.
Daffadars, Rs.37.
Sowars, Rs.30s.
Trumpeters, sowars, and farriers are given an allowance of Rs.5 extra.

The men of this corps are all recruited locally; they are mostly hardy Rajputs of the desert, fond of horses, and accustomed to ride from boyhood; they stand privation well, are light, active, and ideal horse-soldiers.

An assistant-surgeon and a Rajput hospital assistant have medical charge of the corps under the Residency Surgeon.

Maharaj Dhiraj Colonel Sir Pratap Singh, A.D.C., G.C.S.I., commandant of the corps, served on the staff of General Lockhart in the late campaign, and had with him some of the officers and men, of whom all, except two, returned in good health.

The officers and men stationed at Rawulpindi also returned in good health, and only lost one man during their absence of five months. The hospital for the Imperial Service Corps is well located, and built on the approved standard plan for native troops; it is well equipped and well looked after.



Hewson Hospital, Jodhpore (*see page* 260).

Officers, Imperial Service Cavalry. *To face page* 110.

MINTS AND CURRENCIES IN THE WESTERN RAJPUTANA STATES

MARWAR.—There are seven mints in Marwar, viz., at Jodhpore, Pali, Nagore, Sojat, Jalore, Merta, and Kuchawan; but only those at Jodhpore, Pali, Nagore, and Kuchawan are now working.

Gold is only coined at the Jodhpore city mint. Mohrs, half mohrs, and quarter mohrs are coined, and largely used of late years as coat-buttons by the well-to-do. They are rarely met with beyond Marwar limits. The weight of a full Jodhpore gold mohr is 169.9 grains troy, and it is made of pure gold.

The silver coins of the State are the rupee, half rupee, and quarter rupee pieces. The weight of the original Bijeshahi rupee, which was struck about A.D. 1761, and which bears the name of Shah Alum, is 176.4 grains troy, of which 6.5 grains is alloy. In 1858 Maharaja Takhat Singh substituted the name of Her Majesty the Queen for that of Shah Alum. Since then the inscription has more than once undergone changes, still bearing the name of the Queen-Empress. Hitherto the Bijeshahi rupee has been equal to, or of more value than, the British or Kaldár rupee; but since the closing of the Indian mints, about 110 Bijeshahi rupees are required to exchange for 100 Kaldár rupees.

There are numerous marks on the Jodhpore coins, placed by Darogas in charge of mints, or by other State officials; but the special marks of the State are the "Jhar" or the "Turra" of seven or nine branches, and the "Khanda," or the sword.

The original copper coin of the State was the Bijeshahi, which was also called "Dhabbushahi," on account of its great weight. Maharaja Bhim Singh increased its weight, and called it Bhimshahi, after his own name. The weight was again reduced to its original standard, viz., from 320 to 310 grains. The copper coin is now known here as Dhabbushahi, and about fifty-six are equal to Rs.1 Bijeshahi.

The Kuchawan mint coins no gold or copper. The silver coins struck there are called "Ektisundas." They weigh about 168 grains, and are worth 10 or 12 annas Bijeshahi.

Jaisalmir.—The Jaisalmir mint was established in A.D. 1756 by Maharawal Akhe Singh, after whose name the coins are called "Akheshahi." The old Akheshahi rupee weighed 168.75 grains, and contained only 4.22 grains of alloy; but the present Akheshahi rupee weighs only 162½ grains, and is worth about 15 annas Bijeshahi.

Sirohi.—There is no mint in Sirohi, where the Jodhpore copper coin known as Dhabbushahi, and the Kaldar and Bhilari (Meywar) silver coins are current.

Kaldar rupees are current everywhere, also British copper coins and koris are in use in the bazaars.

4 koris or shells	make	1 ganda.
2½ gands	,,	1 damri.
2 damris	,,	1 chhadam.
2 chhadams	,,	1 adhela.
2 adhelas	,,	1 paisa (Dhabbu).
3½ paisa	,,	1 anna.
16 annas	,,	1 rupee (Bijeshahi).

Table of Weight.

3½ paisa	make	1 chattack.
2 chattacks	,,	1 adpáo.
2 adpaos	,,	1 páo.
2 paos	,,	1 ád-seer.

2 ad-seers	make	1 seer.[1]
5 seers	,,	1 panchheri.
10 seers	,,	1 páo-man.
20 seers	,,	1 ád-man.
30 seers	,,	1 pun-man.
40 seers	,,	1 man.

Land Measure.

20 Biswansis	make	1 Biswa.
20 Biswas	,,	1 Bigha.

[1] The Jodhpore seer weighs over two pounds, viz., 100 tolas or Kaldar rupees, while the British seer weighs only 80 tolas or two pounds.

PUBLIC INSTRUCTION

JODHPORE.—Under the management of Pandit Suraj Prakásh, M.A., this Department has recently been much improved, and Marwar boys are beginning to be able to take high places at the University examinations.

The following are the educational institutions in Marwar:—

Jaswant College, Jodhpore.
Darbar High School, Jodhpore.
Girls' School, Jodhpore.
The Sanskrit School.
The Hindi Páthshála.
Eight Anglo-Vernacular District Schools.
Twenty Vernacular District Schools.
The Survey Class, Jodhpore.
The Telegraph Training Class, Jodhpore.

The Jaswant College was established in 1893 as a memorial to His Highness the late Maharaja Jaswant Singh, G.C.S.I. The course of instruction in the college was raised to the B.A. standard and the college staff strengthened in 1896.

The Darbar High School was opened in 1869, and is the oldest English educational institution in the State; the course is up to the entrance standard. Since its establishment many boys have successfully passed the entrance examinations of the Calcutta and Allahabad Universities from it. Most of them are now in Raj service, in the railway and other departments.

The Girls' School was established in 1886, and it has already done much to improve female education, especially among Brahmins, whose children attend in considerable numbers.

The Sanskrit School was established in 1886. The number of scholars in regular attendance is not large, but it is useful to those who appreciate this classical language, principally Brahmins.

The Hindi Branch School is largely attended by boys of different castes, but Mahajans and Brahmins predominate.

The Pargana Schools are eight Anglo-vernacular and twenty primary vernacular; most of them have a considerable attendance of Brahmins and Banias.

The Survey Class is attached to the Jaswant College, and certificates are granted for proficiency after two years' study and examination.

The Telegraph Training Class was opened in 1891 in the Darbar High School, to prepare boys for telegraph work on the railway.

The Noble School was established in 1886, with a view to give instruction to Rajput nobles, among whom education was then very backward. The scheme has had considerable success.

The Elgin Rajput School was established in 1896, for poor Rajputs unable to give their sons a primary education. The boys now educated at this school are intended as recruits for the Imperial Service Troops; they are mostly from small villages where no course of instruction, even in elementary subjects, could be obtained. The Darbar contributes Rs.50,000 annually to support these schools. Besides these State educational institutions, there are many private vernacular schools in the city of Jodhpore and in large towns, principally supported by the trading classes for the use of their children.

The Oswals support the Sardar School, the Kayasths maintain the Sir Pratap School, the Arya Samaj has its own school, Brahmins and Malis have also some schools of their own.

Sirohi.—Education is making fair progress in Sirohi. There is a school at the capital, maintained by the Darbar, in which English, Urdu, and Hindi are taught. There are also Darbar

schools at two of the principal towns, viz., Madar and Rohera, and in many villages Hindi schools are kept up.

JAISALMIR.—During recent years education has made considerable progress at the Jaisalmir capital, where two schools are supported by the Darbar, viz., one Anglo-vernacular and another Hindi. In the larger towns throughout the State, Hindi schools are kept up by private subscription.

Balsamand Lake, Jodhpore.

To face page 117.

WATER SUPPLY

JODHPORE.—Up to the year 1870 the inhabitants of Jodhpore obtained their water supply from wells and the neighbouring hills, from which it was run off into the city and stored in tanks. There were several of these reservoirs, but some being then imperfect and out of repair, only two could be relied on, viz., the "Gulab Sagar" and the "Fateh Sagar," and even these were not annually filled. Moreover, when the rainfall was sufficient to fill them, they only afforded a year's supply to half the city. Jodhpore did not then possess sufficient water storage space for twelve months' provision, and thus the inhabitants were compelled to go long distances to the wells, mostly outside the city walls, for the quantity necessary for their requirements. The water in the tanks having become exhausted, the wells adjacent soon ceased to give a sufficiency to the crowds who swarmed to them, often fighting fiercely in their endeavours to help themselves to a "*ghara*" of water. The consequence was, that the women had to suffer much toil and hardship in bringing water from great distances, or they had to pay exorbitantly for it to the "*bhishtis*," who brought it in on camels or bullocks for sale. The wells here are very deep, and most of them are more or less brackish, often containing an appreciable amount of salt; indeed, some are so briny as to be quite unpotable, except by those inured to salt water.

By 1874 some improvement had taken place, but the water supply of Jodhpore had always been deficient, both because of the want of space for storage, and also on account of

the small annual rainfall. To remedy this, some important works had then been undertaken. Hitherto, much of the available water had been lost from bad collecting arrangements, and there had seldom been nearly enough run into the tanks to suffice for twelve months' consumption.

In January 1875 the tank water had already failed, so that until the next monsoon the people of the city had to fetch their water from wells outside the walls, and sometimes from great distances. The Darbar was put to a considerable monthly expenditure in raising the water, as the wells are very deep. One large tank, the "Baiji-ka-Talao," situated near the Jalore gate, was completed during this year, but it leaked greatly from want of a lime floor. For years this large reservoir was left in this imperfect condition, although a plentiful supply of water was brought into it from the hills south-west of Jodhpore by a masonry aqueduct. The flooring was afterwards improved at a considerable cost, and it has since been useful for the water supply of that side of the city.

Another large work of the same kind was commenced by Maharaja Bakhat Singh, but never completed, viz., the "Bakhat Sagar" tank, which lies to the south-west of the city. The bund is of large extent, and has a considerable catchment from the hills on the west and south-west of Jodhpore city, but water does not remain in it long after the rains have ceased; it, however, keeps the wells in the neighbourhood at a higher level.

By 1889 the water supply had been improved in quality, and more attention has since been given to the preservation of its purity.

In 1890 the water supply was greatly increased by new canals, and further efforts were made to protect the reservoirs from pollution by preventing animals from entering them.

The water supply of Jodhpore at present is mainly derived from two tanks in the city, the "Gulab Sagar" and the "Fateh Sagar," mostly excavated from solid rock, now holding each

about 10,000,000 cubic feet. This supply can meet the demand of the city for about fifteen months. Besides these, there are other tanks of smaller size, viz., the "Ranisar," the "Padamsar," the Baiji-ka-Talao, referred to above, and the "Pratap Sagar," constructed by Colonel Sir Pratap Singh to the memory of his wife; and also two bathing tanks, viz., the "Phulerao" and "Gangelao." The Gulab Sagar is an old work, and was made by "pardayat" Gulábrajji (already referred to) of Maharaja Bijai Singh. The Fateh Sagar was built by Maharaja Bhim Singh, and named after his father, Fateh Singh. The Gulab, Fateh, and Pratap Sagars are supplied by a canal, which runs round the base of the adjacent hills for a distance of three miles to the "Balsamand." This canal was made in the years 1883 to 1885, and was originally intended to fill the tanks from the Balsamand; but it has been found that the water caught from the intervening hills is generally sufficient for a year's supply, and the Balsamand has only been indented on once or twice during recent years.

The Balsamand water, however, is run through a filter, and supplied in pipes to the Raikabagh, the Cavalry Lines, Jail, Railway Station, Residency, and the bungalows of the other Europeans. This tank holds, when full, about 56,000,000 cubic feet, and has a catchment area of six square miles of rock surface.

The following is the analysis of the Balsamand water:—

	Total Solids, grains per gallon.	Chlorine, grains per gallon.	Total Hardness, grains per gallon.	Fixed Hardness, grains per gallon.	Free Ammonia, parts per million.	Albuminoid Ammonia, parts per million
A. Where it leaves the lake	16.8	1.12	5.6	3.5	·16	.14
B. Where it enters the filter	16.8	1.26	5.6	3.5	nil	.16
C. After leaving the filter .	16.8	1.26	5.6	3.5	·02	.16
D. From the Jail pipe . .	18.2	1.82	5.6	2.8	·20	.22

Another tank, "Kailana," has lately been much enlarged. It is about five miles from the city, with which it is connected by a canal. This canal delivers water to the Baiji-ka-Talao, the Chhitar tank, the Shekhawatji-ka-Talao, and the Raikabagh, and ends in the Ratanada tank, from whence the water is conveyed in pipes to the Maharaja's, Sir Pratap Singh's, and other bungalows, Kailana tank originally had a catchment area of about two square miles, mostly rock surface, but this has been lately increased by feeder canals to about six square miles, and the tank is capable of holding about 80,000,000 cubic feet.

A scheme is now under consideration for raising the water of both Kailana and Balsamand to the foot of the Paota hill, where it is to be filtered and then pumped up to a service reservoir on the top of the hill, and distributed through pipes all over the city.

Outside city limits there are several other tanks which supplement the ordinary water supply, viz., Takhat Sagar, Lál Sagar, Gurán-ka-Talao, Názarji-ka-Talao, and Akherajji-ka-Talao, the last of which has been referred to elsewhere.

Amongst the many wells within and around the city, there are only a few which contain sweet water; of these the following may be mentioned as the best, viz., the Raikabagh well, the Kágá well, the Jetá-bera, the Dheron-ká-bera, and Bakhat Sagar-ki-beri. Next to these come two wells at Ramanund Kote, two in Kuchawan Thakar's Haweli, Nauchokia-ka-bera, a well in the compound of the Kotwali, Jia-beri, and Shakkar-beri in Rani Sar, three or four wells in Sursagar, Joshiji-ko-Kuo in Goondi-ka-Mohalla, Mutan-ko-Kuo, Kharbooza-beri, the Nathji's well at Udai Mandar, Taparia-ka-bera, Badi-beri and Taparia-ki-beri in Gangelao tank, Sukhanund-ka-bera, Dewan Sardar Mal's wells in his Bagh, two wells in Raj Bagichi, and two in Nazarbagh, Ram Mohulla-ka-bera, a new well near Baiji-ka-Talao, a well in Kunj Bihariji-Ka-Mandar, and Munshi Shubh Lal's new well in Dhanmandi.

There are about eighty Masjids, most of which have wells within their enclosures, used by Mahomedans.

There are above thirty Baoris or Jhalras in and around the city, some sweet, others brackish, viz., Tanwarji-ka-Jhalra in Makrana Mohalla, which is about 175 years old, with a never-failing supply of water, used for bathing, except in times of great drought, when its water is drunk as a necessity.

Tapi Baori, situated in a very old part of the city, is rectangular in shape, about 200 feet long and 40 feet broad, with steps leading into it for about 80 feet, below which the depth of the water is another 80 or a 100 feet. It was built about 350 years ago by Byas Nathoji, in memory of his father, Tapoji. It has six Poles or gates, resting on six successive platforms, equally distant, each about 25 feet by 18 feet, and supported on pillars and pointed arches; the first two having only one storey, and the third, fourth, fifth, and last, two, three, four, and five storeys respectively. The roofs of the last five Poles are connected by balconies wide enough for a person to walk round; there is much stone carving displayed on the interior of the roofs and pillars, and there is considerable grandeur in the construction of the whole, which is a series of pointed arches and flat roofs, resting on pillars and rising to a great height. The water of this Baori is chiefly used by Pushkarna Brahmins for bathing after funerals.

Nimla Kua, one of the oldest and smallest wells here, was built long before the foundation of the city. Such is the local importance of Tapi Baori and Nimlo Kua, that the following Marwari saying is attached to them, viz., "Tapi baori and Nimlo Kuo, nahin dekhio jiko jeewatohi muo"—"A person who has not seen Tapi Baori and Nimlo Kuo, is dead though alive."

Chand Baori, a very old well, opposite Jeta Bera, was built by the Chohans, and is only used in times of drought for drinking.

Some other wells, very important in times of drought, are: a Baori of sweet water in Golka Mohalla; Pancholi Kesri Singhi-ka-Jhalra, outside Mertia Darwaza-ki-Bari; Nawlakha Jhalra, adjacent to Kesri Singhji-ka-Jhalra; Tiwariji-ka-Jhalra, outside Chand Pole; Jalechiji-ka-Jhalra, adjacent to Tiwariji-ka-Jhalra; Bhandari Rughnath-ki-Baori and Suraj Kund, near Chand Pole; Panchwa Maji-ki-Baori, opposite Vidya Sal; Anaran-ki-Baori, in Vidya Sal; Sugandan-ki-Baori, in Joshian-ki-Bagichi, opposite Vidya Sal; Sri Malan-ki-Baori, near Vidya Sal; a Baori in Miyan-ka-bagh, not far from Vidya Sal; Dhay-ki-Baori, opposite the old temple of Barwasan Mata; Nainsi-ki-Baori, in Nainsi-ka-bagh, adjacent to Dhay-ki-Baori; a Baori at Maharaj Fateh Singh's Raoti; Mahamandar-ka-Jhalra, in Mahamandar, outside Nagori gate, and a large Jhalra near the garden of Sursagar. Since the new water supply from outside has been provided, the above wells are not so much used by the people.

Sirohi.—The water supply of Sirohi city is derived from tanks and wells. The tanks are:—(1) Bara Talao, south-west of the city; (2) Lakherao tank, built by Rao Lakha Singh; and (3) the Abbott Sagar, named after Colonel H. B. Abbott, Resident, W.R.S., and built by the present Maharao, Sir Kesri Singh. It is proposed to distribute water from this tank by pipes throughout the city, which will be a great improvement on the well-water now in use.

There are twenty wells within the city, of which sixteen contain sweet and four brackish water, besides twelve *baoris* around the city, all of which contain sweet water. The depth of the wells varies from 60 to 100 feet.

Jaisalmir.—The capital of Jaisalmir derives its water supply chiefly from a fine large tank known as Garrisar, 300 yards south-east of the city, and said to have been constructed upwards of 500 years ago by Rawal Garsee. There are several other tanks, viz., Gulab Sagar, Dedansar, Eshar Lal's Talao,

Malka Talao, Sudasar, &c.; but owing to the very light rainfall of Jaisalmir, water is rarely found in them after the monsoon season, and then often only in very small quantities.

There are three wells of sweet water within the fort of Jaisalmir, of which Jeslu is the best, and its water has never been known to fail. Outside the fort there are six wells from which good water can generally be obtained at all seasons; the best of these is behind the jail, and was built by Rani Ranawatji of Maharawal Gaj Singh about sixty years ago. The wells vary in depth from 156 to 350 feet.

DRAINAGE

JODHPORE.—There is but little artificial drainage in Jodhpore city, the elevated site of which lends itself admirably to natural flushing. When heavy rain falls, the water running down from the sloping grounds below the fort forms a rapid torrent, which rushes through the main streets, sweeping away in its current the impurities which have, during the dry season, accumulated in the sandy soil of the streets and lanes, and carrying them into a watercourse on the east side of the city, and ultimately away into the open country south-east of Ratanádá. Little attention is given to drainage throughout the country, but the towns and villages are generally on high ground, and are drained by natural watercourses, which have been formed during ages by the rapid escape of rain from the house-tops.

SIROHI.—The city of Sirohi, situated on the slope of a hill, already described, is naturally well drained. The street leading to the palace has good masonry drains, and the lowest part of the town is drained by a natural watercourse, which is flushed during the monsoon season or when a heavy shower falls. The refuse is in this way from time to time carried off to a distance from the city; the streets are also washed in the same way.

JAISALMIR.—The site of the Jaisalmir city is high, and the natural drainage is therefore good. The main street, leading through the city, has good masonry drains. When rain falls in sufficient quantities, the city is washed and the streets flushed; but this is not a regular occurrence, as in some seasons the rainfall is very scanty.

Jodhpore City.

To face page 124.

LIGHTING

Except on special occasions, there are no street lights in any of the cities or towns of these States. On great occasions lighting of the streets is done by rows of small cups containing oil and lighted wicks along the ledges and roofs; this is very effective at a distance, but it dirties the building and is offensive in smell. Kerosene oil lamps are rapidly supplanting the oil cup and wick-light in private houses, and this is very desirable from a sanitary point of view, as smoke is not given off from the former, while the smoke of the latter poisons the atmosphere and destroys the appearance of the houses. The palace at Jodhpore is well lighted with electricity; and the night trains from Jodhpore now have electric lights, which work satisfactorily, and which are a great improvement on the ordinary oil lamps still in use on less advanced lines of railway.

ROADS, RAILWAYS, AND TRAMWAYS

THERE are a few paved roads within the walls of Jodhpore city, mostly leading up the hills, and there is a fine metalled road from the Nagore gate to the fort, and thence to join the Surságar road. An excellent road completely encircles the city, which has branches leading to the different palaces and chief official bungalows. Branches from this road also run to Mandore, the old capital of Marwar, to Balsamand and Kailana, the principal tanks for water storage outside the city, to the Cavalry Lines, to the chief gardens outside the city, and many other places of less importance.

The railway station, the public offices, the college and schools are all adjacent to the principal metalled roads.

Statement of Roads Constructed and Maintained by the Jodhpore State during 1897–98.

Locality.	Length in Miles on 31st March 1898.	
	Unmetalled.	Metalled.
1. About Jodhpore .	2.50	42.65
2. About Pali . . .	.....	.50
3. About Jaswantpura	.....	9.00
4. Sendra to Erinpura	.....	96.00
Total	2.50	148.15

The Jodhpore Railway was commenced early in 1881, and in the beginning of 1885 it was completed up to Jodhpore city, at a cost of Rs.1,103,642. The construction was carried

on from the Rajputana-Malwa Railway at Marwar Junction, which is sixty-four miles distant from Jodhpore city, and there was considerable delay in completing the last twenty miles up to the capital on account of the prejudices which then existed against railways.

The construction of the Luni-Puchbhadra branch, sixty miles in length, was commenced in 1885 and opened for traffic on the 23rd March 1887, at a cost of Rs.1,090,153. This branch was constructed mainly for the salt traffic from the Pachbhadra saltworks, but it has been of great advantage to the people of both Marwar and Jaisalmir for the import of grain in years of scarcity.

The extension of the Jodhpore-Bikanir Railway, 167 miles long (123½ in Marwar and 43½ in Bikanir territory), was commenced in 1889, and opened from Jodhpore to Bikanir on the 9th December 1891. The sums spent on the Marwar section of the line amounted to Rs.2,466,896; the Bikanir section, to Rs.881,220. Total, Rs.3,348,116.

The Merta-Kuchawan section was started in August 1891, and the line was opened on the 13th March 1893. The total expenditure on it amounted to Rs.1,503,417. This branch joins the Rajputana-Malwa Railway at the Sambhar Lake, and considerably shortens the journey to Jeypore, Agra, and Delhi.

At the close of the year 1897–98 the length of the Jodhpore-Bikanir Railway was 364 miles, and it is now being extended both in the direction of Sindh and the Punjab. It is doing much to improve the condition of the country, and its effects on prices during years of short harvests have been very beneficial to the people, while the large profits produced have materially added to the State treasury.

In 1896 a light tramway (two feet gauge) was laid down from the Jodhpore station through the city, which has proved a great convenience to the public, and which has greatly reduced the cost of carriage of grain and other commodities.

The passenger cars of this tramway meet the trains regularly, and are mostly well filled with travellers.

A conservancy tramway for Jodhpore has recently been completed; it is over five miles in length, and serves for the transport of all the city refuse to a suitable distance.

SIROHI.—There is a short metalled road, about a mile in length, which runs through the Sirohi city to the palace; another road from Bāgar to the Abbott Sagar. The Ahmedabad-Ajmere road passes through the State from Erinpura to the foot of Abu on the west side.

The Rajputana-Malwa Railway runs from the north-east in a south-westerly direction through the Sirohi State, and the capital is about fourteen miles west of Pindwara, the nearest station on the line.

JAISALMIR.—Jaisalmir may be described as a country without roads or railways, although a short metalled road has recently been made from the Maharawal's new bungalow through the city, passing the Garrisar tank. Tracks have also been lined out in three directions to the Marwar border, to guide the traveller to the far desert capital.

SLAUGHTER-HOUSES

There are no regular slaughter-houses in these States. Some of the butchers reside in particular streets of the cities, and others outside. Flesh is sold by the butchers outside the city, and also in a few places within the city walls. Goats and sheep are, however, generally slaughtered outside, although some of the Thakars and others kill them in their "*nohrás*" for their own use.

DIVISION OF STATES INTO PARGANAS

MARWAR.—The Marwar State is divided, for administrative purposes, into twenty-four parganas, each presided over by a Hakim. The parganas themselves are grouped together in six circles, each under a superintendent.

The northern parganas are three in number, and vary greatly in character, Nagore being sandy with brackish water, while Merta and Bilara have a clayey soil and much sweet water.

1. Nagore, with an area of 2608 square miles and a population of 252,257, is located in the north of the State. Its soil is sandy, and its chief crops *bajra*, *jowar*, and *til*.

2. Merta, a fertile pargana south of Nagore, has an area of 1616 square miles and a population of 205,704. Its soil is sandy with a clay admixture; its chief crops are *bajra*, wheat, cotton, *guar*, and *til*.

3. Bilara, south-west of Merta, has an area of 792 square miles and a population of 84,952. Its soil is a sandy clay, which is very fertile and gives good crops of wheat and barley.

The north-east parganas are five in number, and Parbatsar is the most fertile of these, the others being dry and sandy with brackish wells.

4. Marothe, south-east of Didwana, has an area of 500 square miles and a population of 56,806. The soil is sandy, and *bajra*, *jowar*, *moth*, wheat, and barley are grown in it.

5. Nawa, south of Marothe, has an area of 300 square miles and a population of 31,538. The soil is sandy, and the chief crops are *bajra* and barley.

6. Sambhar, south of Nawa, a share of which belongs to Jeypore, has an area of 798½ square miles and a population of 8310. The soil is sandy, and the chief crops *bajra* and barley.

7. Didwana, east of Nagore, has an area of 1136 square miles and a population of 54,272. The soil is sandy, and the chief crop *bajra*. Most of the well water is brackish in this pargana.

8. Parbatsar, south of Didwana, has an area of 840 square miles and a population of 104,962. The soil is sandy, and the chief crops *bajra* and barley, with some wheat, *til*, and gram.

The three eastern parganas are fertile wheat-producing lands.

9. Pali, south-west of Bilara, has an area of 1024 square miles and a population of 58,463. The soil is sandy clay, and the chief crops wheat, cotton, *bajra*, *til*, and *jowar*.

10. Bali, south of Pali, has an area of 1544 square miles and a population of 212,479. The soil is clayey, and the chief crops wheat, cotton, *bajra*, gram, *til*, and maize.

11. Sojat, east of Pali, has an area of 1172 square miles and a population of 141,782. The soil is light clay, and the chief crops wheat, cotton, *bajra*, *til*, maize, and gram.

12. Jaitaran, east of Bilara, has an area of 960 square miles and a population of 87,635. The soil is clayey; the chief crops are wheat, cotton, *bajra*, *til*, maize, and *kirana*.

The southern parganas are four in number, and contain much rocky and hill land, in some parts fairly wooded.

13. Sanchore, south of Mallani, with an area of 1776 square miles and a population of 95,890. The soil is sandy, and the chief crops *bajra* and wheat.

14. Jalore, west of Bali, with an area of 1552 square miles and a population of 170,428, has a sandy soil, on which *bajra*, wheat, and *til* are grown.

15. Jaswantpura, east of Sanchore, has an area of 1360 square miles, much of which is hill country and wooded ravines

Its soil is sandy clay, and its chief crops *bajra*, wheat, *til*, and maize.

16. Siwana, north-west of Jalore, is intersected by a range of barren hills. Its area is 760 square miles, and its population 64,747. Its soil is sandy in the low lands and rocky in the high lands; its chief crops are *bajra* and wheat.

The western parganas are three in number, and they are studded with sandhills, many of which shift from time to time.

17. Mallani, north of Sanchore, has an area of 5760 square miles and a population of 221,184. The soil is sandy, and the chief crops are *bajra*, *moth*, and *til*.

18. Sheo, north-west of Mallani, has an area of 2400 square miles and a population of 30,291. Its soil is sandy; chief crop *bajra*.

19. Pachbhadra, east of Mallani, has an area of 856 square miles and a population of 52,904. The soil is very sandy; the chief crops are *bajra* and *moth* in most parts. The subsoil water is saturated with salt.

The north-western parganas are four in number, and there is much floating sand throughout this part of the country.

20. Jodhpore, north-east of Pachbhadra, has an area of 2896 square miles and a population of 327,267. The soil is sandy, with plateaus of bare rock and occasional projecting ridges of sandstone; the chief crops are *bajra*, wheat, barley, *til*, and cotton.

21. Shergarh, west of Jodhpore, has an area of 1456 square miles and a population of 70,919. The soil is sandy; chief crop *bajra*.

22. Sankra, west of Shergarh, has an area of 1264 square miles and a population of 10,074. The soil is sandy; chief crops *bajra* and *moth*.

23. Phalodi, west of Nagore, has an area of 2624 square miles and a population of 71,803. The soil is very sandy; chief crop *bajra*.

The parganas are artificial divisions, and are changed from time to time for convenience of administration. Bali has been quite recently divided into two parganas, viz., Bali and Desuri; the latter includes a considerable portion of the Aravalli range of hills and forest country.

As regards the distribution of Jagir or alienated, and Khalsa or fiscal villages, the former are more numerous towards the borders, and the latter towards the centre of the State. Grants of land were generally given on the border, where administration was more difficult to carry on than towards the centre, which was more directly under the eye of authority, and more easily kept in order.

The State of Sirohi is divided into thirteen parganas or Tehsils, as follows:—

1. Pindwara, north of Rohera, chief town Pindwara; chief products wheat, barley, oil seeds, *karang*, *maka*, *kuri*, *barti*, *jowar*, and cotton.

2. Khuni, north of Pindwara, chief town Panchalia; chief products wheat, barley, oil seeds, *karang*, *maka*, *bajra*, *til*, *barti*, *jowar*, and cotton.

3. Sheoganj, north of Khuni and adjacent to Erinpura cantonment, chief town Sheoganj; chief products wheat, barley, oil seeds, *karang*, *maka*, *bajra*, *til*, *barti*, *jowar*, and cotton.

4. Jhorá Kháral, west of Khuni, chief town Barloot; chief products wheat, barley, oil seeds, *karang*, *maka*, *kuri*, *barti*, *jowar*, cotton, and gram.

5. Magrá, south of Jhorá Kháral, chief town Kalindri; chief products wheat, barley, oil seeds, *karang*, *maka*, *bajra*, *til*, *kuri*, *barti*, and *jowar*.

6. Pamera, south of Magra, chief town Pamera; chief products wheat, barley, oil seeds, *maka*, *bajra*, and *jowar*.

7. Anadra, south of Pamera, chief town Anandra; chief products wheat, barley, oil seeds, *maka*, *bajra*, *jowar*.

8. Mandár, south of Anadra, chief town Mandár; chief products wheat, barley, oil seeds, *maka*, *bajra*, *jowar*, and *kuri*.

9. Santhpore, south-east of Anadra, chief town Santhpore; chief products wheat, barley, oil seeds, *maka*, *jowar*, and gram.

10. Bhakar, east of Santhpore, chief town Shad Khejda; chief products wheat, barley, oil seeds, *maka*, *jowar*, and gram.

11. Rohera, north of Bhákar, chief town Rohera; chief products wheat, barley, oil seeds, *maka*, and *jowar*.

12. Abu, east of Anadra, chief town Abu Station; chief products, wheat, barley, *maka*, and potatoes.

13. Kerari, north of Santhpore, chief town Kerari (Abu Road); wheat, gram, and *maka* are the chief products.

The State of JAISALMIR is divided into eighteen parganas, each under a Hakim, as follows:—

1. Nagar Ganta or Jaisalmir. This pargana is stony or hard desert, and its chief town, Jaisalmir, is the capital of the State, in the centre of which it is situated.

2. Devi Kote, north-east of Jaisalmir, is stony, with sandhills here and there. There is a large temple of Devi in the town, which is the headquarters of the Hakim, but this was devastated by Dewan Salem Singh above a hundred years ago.

3. Fatehgarh or Vinjoria, south-west of Devi Kote, is a hard desert; its headquarters are a small village of 445 souls.

4. Lakha, south-west of Fatehgarh, is a hard and sandy desert, containing some sandhills locally known as *tibas;* its headquarters are Lakha.

5. Miajlar, west of Lakha, is sandy, with many *tibas;* its headquarters, Miajlar, is a village of 818 souls.

6. Sam Khaba, north of Miajlar, was once thickly populated, but it is now almost deserted. There is a very large *kharin* or "bunded" valley at Khaba, where water remains for three or four months, and in which wheat is grown; its headquarters are at Sam, a very small village of 267 souls only.

7. Shahgarh, north-west of Sam Khaba, is high *tiba* land; water is sweet, and found within 60 feet of the surface, but the floating sand prevents cultivation. The chief village of the Hakumat contains 150 houses, occupied mostly by Mahomedans.

8. Ghotaru, north of Shahgarh, is a small sandy pargana with large *tibas;* the population of the headquarters is Mahomedan. It has a fine fort, which was restored to Jaisalmir by the Supreme Government after the Sindh war.

9. Kharo Khuiala, north of Sam Khaba, is hard desert, with some *tibas* and watered valleys. The headquarters, Khuiala, contain about 150 houses.

10. Ramgarh, east of Kharo Khuiala, is hard desert, with *kharins* between the stony ridges, where wheat is produced. There is a temple of Vishnu in the fort, the headquarters of the Hakim.

11. Tanot, north of Ramgarh, being mostly *tiba* land, there is very little cultivation. The headquarters, Tanot, situated eighty miles from Jaisalmir, was the old capital of the Bhatis in the eighth century.

12. Kishengarh, north of Tanot, is *tiba* land. It formerly belonged to Bahawalpore, then called Deangarh. The headquarters, a village of the same name, contain about a hundred houses, mostly built of bricks. There is little *bajra* grown.

13. Barawah Buili, east of Ramgarh, is a hard and sandy desert. Its headquarters is Buili, a small village containing 411 souls.

14. Dewa, south-east of Ramgarh, is composed of hard ridges, with *kharins* between, some of which are salt-producing. Its headquarters, Dewa, is a very small village, containing 228 souls, and has a small fort. The Darbar stud is located there.

15. Mohangarh, east of Dewa, is partly sandy and partly stony desert. It produces *bajra* and grass.

16. Nochna, east of Mohangarh, is sandy desert with many *tibas*. Its headquarters, a village of the same name, contain 225 houses and a small fort.

17. Nokh, east of Nochna, has about 200 houses in the headquarters village. Sweet water is found near the surface. Vegetables, some wheat, and much *bajra* are produced in this pargana.

18. Bap, south-west of Nokh, is mostly stony desert. There are some tanks, *kharins*, and one large salt runn in this pargana. Wheat is extensively grown in the *kharins*.

PRINCIPAL FAIRS

JODHPORE.—The chief fairs are held in Jodhpore city, at Girdikote, Dhánmandi, Gulab Sagar, and Chand Pole, at different seasons of the year. The Gangore and Tij festivals are celebrated in the city with great show and display of holiday costume.

On each Monday of the month of Sáwan (about July) there is a fair held at Mandore, which is largely attended by men, women, and children gaily dressed. Feasting and music, in picnic form, are the principal features of these occasions; but these fairs are held for the worship of Baijnathji (a form of Shiva). The worshippers go out on Sunday evening, and remain awake the whole night reciting hymns in praise of the deity, which is called "Jagaran." Early on Monday morning, after the worship of Mahadeo, they return to Mandore, and are met there by many others, who come out of the city solely on account of the fair.

The Mandalnáth fair is held on Chait bud 13th, about six miles from the city of Jodhpore, for the worship of Mandalnath Mahadeo, another form of Shiva.

A great fair is held at Barli, eight miles from the city, on Bhadwá sud 13th, to worship a deity called Barli-ká-Bheronji.

At Kágá, about a quarter of a mile from the Nagori gate, a fair is held in the month of Chait in honour of Sitla Mata, the protectress of children, to which women chiefly resort for worship.

At Ratanada, about a mile from the Mertia gate, a fair is held on Bhadwa sud 4th, in honour of Ganesh, the god of wisdom.

At Masuriá-ka-Bhákar a fair is held on Bhadwa sud 2nd in honour of Ramdeoji. The place is about a mile to the south of the city, and the pilgrims rendezvous there before forming a procession to the shrine at Ramdeora, near Pohkaran.

There are many other fairs held in different parganas of the State, the principal of which are as follows :—

The Balotra or Tilwara fair is held at the end of March, in honour of Mallinath, the progenitor of the Mallani Sardars. People from Marwar and other parts of Rajputana, Gujerat, and Scindh congregate in great numbers for purposes of trade, pleasure, and worship. Horses, bullocks, camels, hides, tanned leather, brass and tin utensils, and wearing apparel have a large sale there. The principal object of adoration is the shrine of Mallinath. All sellers of animals or goods are expected to make a small offering of either money or food at the temple, and the general cry of all the Hindus throughout the fair is "Jai Mallinathji."

At Mundwa, ten miles from Nagore, a fair is held in the months of December and January; it is largely attended by 30,000 or 40,000 travellers from a distance, as well as by local people. It was instituted by Maharaja Bakhat Singh in honour of Shri Krishna, under the name of Girdhari. Bullocks are sold in large numbers at this fair, and it brings in a good annual income to the State treasury.

The Parbatsar fair is held in the month of Bhadon (August), in honour of Tejaji, who is credited with the power of curing snake-bite. It lasts for ten days, and is a great cattle fair, well attended by Játs and Punjabi buyers.

The Ram Deora fair is held in the month of Bhadon (August), and is largely attended by pilgrims from Marwar, Meywar, Bikanir, Central India, Jaisalmir, and other places. It is held in honour of Ram Deo, and the waters of the pool or tank there are said to possess great healing properties, and

even to open the eyes of the blind. The income of this fair goes to the local priests and the Thakar of Pohkaran.

The Bilara fair is held in March, and lasts for one day only; the people congregate near a spring of water about four miles from the village of Bilara, and the legend is that Raja Bal was in the habit of giving great feasts at this spot. The deity, Ganga, appeared to him once in a dream, and told him that if he shot an arrow into this spring she would appear there, and that the water of the spring would in future become as sacred as that of the holy Ganges itself. Bal obeyed her order, and the water of this spring has ever since been held sacred, especially by the poorer classes, and the place is called Báhn Ganga, from *bahn*, an arrow.

The Barkana fair is held in Godwar, at a Jain temple 1200 years old, in the month of Pos (December). People from the adjacent countries of Meywar and Sirohi, as well as the local inhabitants, attend this fair, which lasts for two days.

A fair is held in the end of February or beginning of March at the temple of Gorakhnath, on the top of a hill called Goramber (a corruption of the word Gorakhnath), four miles from the village of Saran, in Sojat.

Sirohi.—At the religious gatherings in Sirohi no trade is carried on except at the Bámanwáji Jain temple, where a large fair is held in March, and where a considerable trade is carried on in cloths, ivory articles, opium, cotton, cocoanuts, and sugar. This fair is well attended by people from Sirohi and neighbouring States; it is of old standing, and lasts for seven days.

At Phalodi, in the Magra pargana, a fair takes place in the month of August for the worship of Baijnathji, a form of Shiva. Over a thousand people are said to attend this fair, which is wholly religious.

There is a fair held in September for the worship of Mahadeo at the shrine of Sarneshwar, about two miles from

the city of Sirohi. Sarneshwar is the "Isht Devata" of the Sirohi chiefs; the temples are on the hillside, above the burning-ground of the ruling family.

A fair is held on Bhádwá sud 9th in honour of Kálká Devi, and another in honour of Mátar Mátá on Chait bud 14th, at the Sirohi city.

Religious fairs are also held at Bamanwaji, at Gungoopia, Mahadeo's temple in Khuni, at Karori Dhaj's shrine near Anadra, and at Rakhikesh on the other side of Abu.

Jaisalmir.—There are two principal religious fairs held in Jaisalmir; one of these is celebrated on the last day of the month of Baisákh, or April, at Bramkunká, about ten miles from the city of Jaisalmir. The fair lasts for two days. The other fair is held in honour of Goga (a saint famous for his charity and bravery in the thirteenth century) at the same place, in August or September of each year. Both of the fairs are largely attended. Other fairs, of less note, are also held, but no trade of importance is carried on at them.

Besides the special fairs held in each of the three Western Rajputana States, the following principal festivals are observed throughout Rajputana:—

The *Nauratri* is held in honour of the Hindu goddess Devi or Mata in the month of Chait. "Chait Sudi" 9th is the anniversary of Rama's birth. On this day horses, elephants, and all the implements of war are worshipped by the Rajputs.

The *Dassera* is held in Asoj (October), in commemoration of the victory of Rama, king of Ajodhya, over Ráwan, king of Lanka (Ceylon); the "tenth of Asoj" is consequently deemed by the Rajput a fortunate day for enterprise or engaging in war.

The *Dewali* or *Festival of Lamps* is held on the 15th of Katik (October), and is one of the most brilliant festivals of the season. On this occasion all cities, towns, and villages are

illuminated by the inhabitants, and during the night the wealthy worship silver coins in honour of Lakshmi, *the goddess of wealth*, to whom the day is consecrated.

The *Holi* is held on the last day of the month of Phagan (March), and named after Holica, sister of Hirnákush, the great atheist, who tried in many ways to destroy his son, Pehlád, for believing in God, but invariably failed. Finally, Hirnákush instigated Holica to carry his son into flames, in the hope that he might be consumed. However, Pehlád escaped, while Holica was burned, although she had hitherto been able to bathe in fire without injury.

The *Sil Satami* festival is held on *Chait badi sátam*, or 7th of the month Chait, in honour of the goddess Sitla, the protectress of children, and there is a great concourse of females to her shrine, with their offerings, on the occasion.

The *Gangore* is held in the month of Chait; it is one of the most picturesque gatherings of the season, both sexes appearing in their holiday costumes on the occasion. Gouri or Gour is one of the names of Párvati, wife of the great god Mahadeo or Ishwara, who attends with her during this festival. Every wealthy family possesses these images, and Gouri is represented as the goddess of abundance. The female members of each family are particularly interested in this festival; they give much attention to the dressing of the idols, and through Gouri invoke blessings on their husbands for several days before the images are carried in procession to a lake or tank, where they are treated to change of scene and music before they are divested of their rich robes and jewels, which are then laid up in store for another occasion.

The *Tij* is celebrated on *Sawan badi Tij*, or the "3rd" of Sáwan. The occasion is sacred to the mountain goddess *Parvati*, being the day on which, after long separation, she was reunited to Shiva. She accordingly declared it holy, and proclaimed that whoever invoked her on that date should receive

whatever they desired. The Tij is accordingly held in particular reverence by women.

The *Akhá-Tij* is observed in the month of Baisakh, after the reaping of the wheat crop, when new grain is eaten by the whole Hindu community.

The *Rakhi* festival is held in August, when all the Hindus have *rakhis* (bracelets) fastened on their wrists by the Brahmins, and make the latter presents in return. Sisters also fasten bracelets on to their brothers' wrists, or on the wrists of others with whom they wish to make a standing friendship, and who can afterwards act as their protectors.

The *Salgireh*, or birthday of the chief, is also an occasion of much display and rejoicing.

On all great occasions Darbars are held by the chiefs, and nazars presented by their subjects.

HISTORY OF FAMINES

THERE is no regularly recorded account of the famines which have visited the Western Rajputana States from time to time during the present or previous centuries. Of the three Western Rajputana States, Jodhpore and Jaisalmir are liable to frequent famines or years of scarcity, on account of their extensive sandy tracts, and their position with regard to the monsoon currents, the extreme ends only of which they receive. Sirohi is more within the rainy zone, and its densely wooded hills generally attract a fair share of the monsoon clouds.

Marwar or Jodhpore is subject to partial periodical failures of grass or grain crops, but a failure of both in the same year is fortunately uncommon.

The year 1813 was a most calamitous one for Marwar. The grain crops completely failed, food stuffs sold at three seers per rupee, in many places they could not be purchased at any price, and numbers of Marwaris died of starvation. Fortunately, there was some grass, and the herds were generally saved. Sirohi and Jaisalmir both suffered from famine and high prices in this year, although less severely than Marwar.

The official year 1868–69 is still remembered as a most terrible one for MARWAR, as well as for many other parts of India. General Brooke has written to the following effect regarding the famine in Marwar :—

The rainy season of 1868 commenced early in June. The first falls were succeeded by a long break, during which

the grass and seeds sprouted and then withered away; fields were again ploughed and seed sown. A second fall of rain in the early part of July caused the crops to attain a height of several inches, and the grass to appear again above ground, but not sufficiently high to be grazed by cattle. No other showers suceeeded; a strong, cool, south-westerly wind blew steadily day and night, which carried no moisture with it to fertilise the ground. Week after week of the same weather passed. The stunted crops made futile efforts to form heads of seed, and the grass became thinner and thinner, till the fierce October sun burnt up altogether what remained, leaving Marwar an arid and withered expanse. It will be observed that this year Marwar suffered both from grass and grain famine. People had long been accustomed to emigrate to Malwa, but it did not offer the same relief as it did in former years.

Two mighty streams of human beings and cattle poured from the south-eastern portions of the country, of which the greatest crossed the Aravalli Mountains at the Desuri Pass. They found some grass in Meywar, but a large portion passed on to the jungle below Rutlam, and the remainder to Malwa, those arriving first securing the best pastures. The poor people who arrived in Malwa late had to pass on, and were reduced to the last extremity of distress. The second great stream of emigrants passed *via* Palanpur into Gujerat, and some towards Radhanpur. They, too, were doomed to bitter disappointment. The great floods which devastated Gujerat in August left nothing but a desert for the Marwar herds. They were driven farther, dying of starvation at each stage, till a few only reached the jungles east of Baroda. Here difference of climate and forage killed off large numbers, and those who went towards Radhanpur had met the same fate. Measures were adopted to supply Marwar with food from Sindh. The Marwar Darbar abolished the import duties on

grain in Marwar, and the Thakars of Mallani consented to the abolition of their charges on grain. Food was given at various places in Jodhpore, Pali, &c., by wealthy inhabitants and by religious communities. Rani Jarechiji distributed daily seven maunds of cooked food, besides double handfuls of grain, after nightfall, to the numerous class who were in too respectable a position to beg. From four hundred to five hundred people were daily employed on a road, constructed from the Agency to the Jalore gate of the city.

The *rabi* at one time promised well. Light rain fell in January and again in February, and recovered what before was yellow and sickly; but, later in the season, stormy, cloudy weather came on which blighted the growing wheat, and an expected 10-anna was reduced to a 6½-anna crop.

The increase of distress during the famine is shown by the ruling prices of wheat in the Jodhpore bazaar, commencing from July 1868, when famine was not anticipated. The lowest price quoted during the period of scarcity was 3¾ seers per rupee.

Price of Wheat at Jodhpore during the Famine of 1868 and 1869.

	British Seers per Rupee.			British Seers per Rupee.	
1868.	Srs.	Chs.	1869.	Srs.	Chs.
July . . .	14	8	July . . .	5	0
August . . .	12	0	August . . .	4	12
September . .	8	12	September . .	4	9
October . . .	6	10	October . . .	5	10
November . .	6	0	November . .	5	10
December . .	6	12	December . .	6	0
1869.			1870.		
January . . .	6	10	January . . .	6	8
February . . .	6	8	February . . .	6	8
March . . .	6	8	March . . .	6	12
April . . .	6	0	April . . .	7	0
May . . .	5	8	1st May . . .	8	8
June . . .	5	8			

Thousands of Marwar emigrants died in the countries to which they had gone, and innumerable herds of cattle perished. It is estimated that Marwar alone suffered a loss of 373,000 souls and 200,000 head of cattle during this terrible famine.

The rainfall in this year was also exceedingly scanty in SIROHI. On Abu it was only 30 inches, or less than half of that of the previous year; whilst in other parts of the State it did not exceed one quarter the average. The *kharif* crops, consequently, generally failed. The *rabi* crop for some time promised well, but during March most unseasonable weather set in, and heavy rain and blight so damaged the ripening crops, that the out-turn was only about six annas in the rupee. Owing to the failure of the crops, wheat, which in July had been selling at 30 lbs. per rupee on Abu, and 34 lbs. in the plains below, had by the middle of September risen to 14 and 16 lbs., and soon afterwards to 12 and 14 lbs. respectively. Early in November His Highness the Rao issued a proclamation remitting the dues on grain, and interdicting all obstruction to or interference in its free export and import.

Amongst the lower castes, viz., Grasias, Minas, and Bhils, the famine had pressed very heavily. For some months after the rains they earned a livelihood by collecting grass and fodder for cattle, and used to increase their precarious meals by adding thereto a large proportion of the bark of the *khejra* tree, or the barbed seed of the *gokroo*, ground to a fine flour. The carcasses of dead cattle, which perished in numbers, were also eagerly devoured by these people. Numbers flocked to Abu and Anadra for employment. To provide work, a relief fund was raised by the European residents of Abu and Deesa, to which the Rao contributed Rs.100 per mensem. The Rao further devoted a sum of Rs.5000 for the purpose of deepening the city tank at the capital, as a relief work. In addition to these measures, His Highness made remissions throughout the country generally, on the rights ordinarily payable to the State

by its subjects. The mortality in cattle, owing to the want of fodder, was more than one-half of the whole, or about 75 per cent.

Sirohi depended on Gujerat for its supply of grain, and immense quantities were imported from Ahmedabad, Puttun, and Sidhpore; but prices were very high. In the middle of July 1869 wheat was selling at 4 seers 13½ chittacks, and *bajra* at 5 seers 5 chittacks per rupee, and at the end of September wheat was at 4 seers 6½ chittacks, and *bajra* at 4 seers 7½ chittacks.

Jaisalmir.—The great famine of 1868–69 affected Jaisalmir severely, nevertheless in a mild degree when compared with Marwar. Grain was procurable in Sindh, and it was imported across the Jaisalmir desert to Marwar, giving employment to men and camels. In this manner some of the needy were able to obtain a livelihood, while many others migrated to Sindh, where they found employment in the irrigated fields and canals adjacent to the Indus.

1877–78.

Jodhpore.—The rainfall for 1877–78 was 4½ inches only, as compared with 23.65 of the previous year. The rain crop, which provides the staple food of the country, was only 4 annas in a rupee; while the spring crop fared still worse, and throughout the State not more than one-fifth of the normal produce was secured. The difficulties thus caused were aggravated by an unusually severe grass famine, which induced some 80,000 persons with 200,000 head of cattle to emigrate towards Gujerat and Malwa. Of these, about 60,000 men and 120,000 cattle returned. The long journey both ways had told upon the health of the emigrants, and many of them died on the road. The Darbar arranged for the relief of some of these sufferers, and despatched two high officials with money to purchase food for them. The loss to the State occasioned

by the bad season was estimated at ten lakhs of rupees. An abstract of the prices of food grains prevailing during the year 1878–79 is given below:—

	Wheat.		Jowar.		Bajra.	
1878.	Srs.	Chs.	Srs.	Chs.	Srs.	Chs.
April . . .	10	14	16	12	14	8
May . . .	10	14	16	12	14	8
June . . .	7	3	8	7	7	15
July . . .	7	13	10	10	9	4
August . . .	7	6	11	14	10	0
September . .	7	13	12	7	10	0
October . . .	7	9	11	11	10	0
November . .	7	10	11	14	10	10
December . .	7	11	11	14	11	6
1879.						
January . . .	7	8	11	14	11	4
February . . .	7	2	11	5	9	13
March . . .	7	13	10	0	10	7

Sirohi.—Owing to the scanty rainfall, the *kharif* crops were totally destroyed, but the *rabi* crops were not so bad. It rained only 8.45 inches, and was 16 inches less than the previous year. The stock of grain stored in the country was calculated to be sufficient to last for eighteen months. There was, therefore, no apprehension of a total failure of food supply. The main wealth of the people consists in their flocks and herds. The partial dearth of fodder, therefore, was the cause of much anxiety to the State. From the first, when a scarcity and consequent distress was anticipated, the Rao was ready to organise measures to help the people, and orders were issued to all the Tehsildars to be ready to collect grain and to find employment for such as would need it.

The prices of food grains prevailing during the famine were:—

Wheat	8½ seers
Barley	12 ,,
Bajra	9 ,,

The rainfall on Abu and the surrounding hills was scanty. In place of the usual average of 65 inches, there fell this year 16.65 inches only. Grass, which hitherto in the worst years of famine was to be found in considerable quantity on these hills, was this year exceedingly scarce.

The scanty rainfall affected JAISALMIR in a minor degree, but the stores of grain and grass in the country proved sufficient for requirements, and there was no unusual emigration.

1891–92.

JODHPORE.—The official year 1891–92 was again one of considerable scarcity, and many of the people had insufficient stocks of grain in store.

The rainfall of this year was untimely and very partial, only 8.76 inches having been registered; so the result was failure of crops and grass throughout a great part of Marwar. The scarcity was most severe in the Western Parganas of Phalodi, Shergarh, Pachbhadra, Siwana, Mallani, and Sanchore. Portions of Sanchore, Mallani, and Phalodi, as also the Western Parganas of Sheo and Sankra, which are very liable to famine, were, on this occasion, saved by the fitful rainfall of the year. The most favoured Parganas were Sambhar, Nawa, Marothe, and parts of Didwana and Parbatsar. The prices of wheat and barley rose considerably, while the rise in the price of *bajra* was slight, and this was solely due to the railway, by which millet was largely imported to meet the requirements of the people; 1,662,584 maunds more were carried by rail than in the previous year. Grass, too, was imported by rail in large quantities, and sold at the capital at 24 seers a rupee.

199,600 persons emigrated from Marwar, of which 126,478 returned; 661,906 cattle were driven away from the country, of which 384,527 were brought back. Many of the emigrants died of cholera, which was then prevalent.

Relief works were started at many places throughout the State and Rs.996,270 spent on them. The Darbar also distributed gratuitous relief to the infirm by means of poor-houses at the capital and district headquarters, and medical aid was provided for the sick at the works. 23,505 persons received gratuitous relief at a cost of Rs.28,064. Private charity was largely given, both at Jodhpore and throughout the State.

JAISALMIR.—Owing to the very light rainfall of the year, viz., $4\frac{1}{2}$ inches, little crops were reaped, and scarcity was general throughout the State. Prices of wheat, *bajra*, and *jowar* rose considerably. Grass was fairly plentiful, so many of the cattle remained in the country. Grain was largely imported from Sindh and by the railway. Nevertheless 11,725 people, with some of their herds, migrated to Sindh, of which 2315 did not return to Jaisalmir.

Table Showing Prices of Grain during the Famine.

	Wheat.		Bajra.		Jowar.	
1892.	Srs.	Chs.	Srs.	Chs.	Srs.	Chs.
February . . .	8	0	9	0	10	8
March . . .	8	0	9	2	10	9
April . . .	8	0	9	$4\frac{1}{2}$	10	11
May . . .	8	0	9	4	10	10
June . . .	8	0	9	0	11	$11\frac{1}{2}$
July . . .	8	10	9	4	10	14
August . . .	8	9	11	2	12	4

Relief works were opened by the Darbar, but most of the people were disinclined to labour, as they are not accustomed to steady hard work. Rs.54,659 were spent on them, and gratuitous relief was also given, both by the Darbar and some of the rich traders.

SIROHI.—The people of this State had to contend to some extent with increased prices during this year, but they did not suffer from actual famine at any time.

1896–97.

From June 1896 to August 1897 scarcity prevailed in Jaisalmir and parts of Marwar, but Sirohi did not suffer, except from high prices consequent on the unusual export of grain to Bikanir and other places where the crops had failed.

Jodhpore.—In 1896 the rainfall of Marwar was very little below the average. It fell unseasonably for crops in several parganas, and little was produced in the north and east of the State; grass was also very bad in many parts of Marwar, and there was considerable migration and driving off of cattle in search of pasture. It was estimated that 17,660 persons migrated to Malwa, of whom 12,467 returned after the distress was over, and that 101,289 head of cattle were driven away from the country on account of the grass failure. Only five parganas were affected, and in the southern and western districts of the State the *bajra* crops were so good and abundant that an unusual export of millet to Bikanir and other famine-stricken provinces took place.

Relief works were opened in all the affected parganas, which cost the Darbar Rs.165,883, and gratuitous relief to the extent of Rs.18,491 was also given to those unable to work. Besides, there was much private relief given by the well-to-do.

No special famine hospitals were opened in Marwar, but the hospital assistants in the affected parganas took charge of the sick and attended to sanitation on the relief works.

Jaisalmir.—In 1896 only 3.63 inches of rain were registered at Jaisalmir. Consequently hardly any crops in the State came to maturity, and the people had to rely greatly on imported grain to supplement their stores left over from the previous year's harvest, which had not been very abundant. Many of the people migrated to Sindh with their herds and flocks, although relief works had been opened at the capital and in several other places throughout the State. The Darbar spent Rs.86,000 on relief works, and Rs.10,812 on gratuitous

relief to those unable to work. Medical relief was also provided. 25,143 persons emigrated, and of these 13,155 returned.

The prices of the principal food grains in Marwar and Jaisalmir from August 1896 to September 1897, obtainable per rupee, are given below:—

Marwar.	Wheat.		Bajra		Jaisalmir.	Wheat.		Bajra.	
1896.	Srs.	Chs.	Srs.	Chs.	1896.	Srs.	Chs.	Srs.	Chs.
August	10	11	12	13	August	10	0	10	8
September	9	13	10	15	September	10	0	10	5
October	8	8	8	12	October	7	15	9	4
November	6	14	8	7	November	7	3	8	12
December	6	14	8	12	December	7	0	8	12
1897.					1897.				
January	7	6	9	10	January	7	3	8	6
February	8	2	10	0	February	7	2	8	9
March	8	2	10	0	March	7	1	9	3
April	8	10	10	0	April	6	4	8	4
May	8	12	10	0	May	7	2	8	7
June	8	12	10	0	June	7	12	8	5
July	8	12	9	5	July	7	9	8	4
August	7	13	8	4	August	7	11	8	10
September	7	8	8	9½	September	6	14	9	13

1898

The monsoon of 1898 was again capricious, and the rainfall registered in these States was little more than half the average. Consequently, most of the crops failed throughout, and there was little grass in either Marwar or Sirohi.

In Jaisalmir only about 3½ inches of rain were registered. Nevertheless, it fell so opportunely, that there was a fair crop of grass, but it was not sufficient to bring much of the *bajra* into ear.

As soon as the monsoon failure was certain, grain was imported by rail in large quantities from the abundant stocks over in adjacent provinces, where the previous harvest had been unusually good. Consequently, the prices of food stuffs have ranged low throughout the year. Many of the cattle have, however, had to be driven away to Sindh and Malwa in search of pasture.

General Remarks on Famines in the Western Rajputana States.

Famines in the thinly populated districts of Western Rajputana are not so severe on the inhabitants, although much more frequent than in the congested areas of Bengal, Madras, and Bombay. Many of the people have hoards of grain laid up against the ever-recurring bad seasons, and many of the poor people, during years of scarcity, manage to subsist almost altogether on roots and seeds of grass found in the desert. Failure of crops and grass is so frequent in the western desert, that the people are semi-nomadic in their habits. When the monsoon fails, they leave their homes, with their herds and flocks, to find pasture before the animals become too impoverished to make the long journeys into Kotah, Malwa, and Sindh, which they have frequently to do on account of the capriciousness of the rainfall. Also, like the harvest-men of the West of Ireland, many of the labouring classes in these parts migrate annually in search of work to the rich valleys of the Indus and the opium fields of Kotah and Malwa. In this way they tide over frequent bad seasons, and accumulate money for their marriages and funeral feasts, as well as for their tobacco, opium, and wine—creature comforts which the poor could not obtain in their own desert villages, where employment is uncertain and labour badly remunerated.

Money advances for the purchase of food in bad seasons are made by the Marwari money-lenders to their own countrymen without much security; and the Jodhpore-Bikanir Railway will soon be able to place grain within easy reach of almost every one. Consequently, failure of the monsoon is being divested of some of the severity which attended it before the introduction of railways.

DISPOSAL OF THE DEAD

Most of the Hindus of these States dispose of the dead by cremation; burning-grounds, with artistic *chhattris* erected to the memory of the great departed, may be seen adjacent to any city or large town. Some of the *dewals* on the cremation-grounds of the ruling families are very handsome edifices. Many of the burning-grounds are in the beds of dry rivers or streams, so that the ashes may be carried away to the sacred river by the floods in the monsoon season, when the relations cannot afford to convey them to the Ganges. A few Hindus, such as Sannyasis, Gusains, Kabirpanthis, Bishnois, and Naths, are buried, also Hindu children who die before they leave their mother's breasts. Bhils, Sansis, Jogis, Sweepers, Dheds, and other low castes bury their dead.

There are sixteen principal cremation-grounds without the walls of the city of Jodhpore where Hindus are cremated. Certain influential Oswals are cremated in their own gardens outside Chánd Pole, and *chhattris* erected over the burning-grounds to their memories. The late Maharaja Jaswant Singh and his three widows—Maji Panwarji, Maji Deoriji, and Maji Shekhawatji—were, however, cremated within the city at Deokund, on a bare rock near the fort, and this is now to be the cremation-ground of the ruling family of Jodhpore. Satis continued to take place up to the death of Maharaja Man Singh, but the custom has now quite gone out, although many of the people complained that it was not allowed when Maharaja Takhat Singh died.

Besides the site of the *chhattris* of the ruling family adjacent

to the temples of Sarneshwar Mahadeo, about two miles from Sirohi, there are three other principal cremation-grounds, and these are all at a short distance from the city.

There are two principal cremation-grounds adjacent to the city of Jaisalmir, and the ruling family is cremated about five miles distant, where there are some beautiful *chhattris* erected. The *chhattri* of Maharawal Bairi Sal has recently been completed, and it is a very handsome structure in early Hindu style.

All Mahomedans bury their dead, and they generally have their cemeteries adjacent to tanks, which is insanitary, and frequently gives rise to unhealthiness in towns.

There are nine or ten principal Mahomedan burial-grounds at Jodhpore without the city walls, of which all except two—Paota and Malikshaji-ka-Takia—are in use.

Not far from Bhandelao, the chief cremation-ground of Hindus of all castes already referred to, is situated the only Parsi burial-ground adjacent to Jodhpore.

There is only one Mahomedan burial-ground at Sirohi city.

There are three Mahomedan burial-grounds in the neighbourhood of Jaisalmir city, but there is nothing noteworthy to remark regarding them, except that two of them are near tanks, and are therefore a source of danger to the public health when the water is required for use.

There are two European cemeteries at Jodhpore; one of these has only one grave in it, and the other only a very few, mostly of Eurasian children. There are some Europeans buried at Balmer in Mallani, and some Frenchmen of Scindia's army at Merta.

In Sirohi State there are three important Christian cemeteries, viz., one at Mount Abu, one at Erinpura, and one at Abu Road. There is an European grave, well kept, at Kalindri village, and two or three at other railway stations.

There is no European cemetery in Jaisalmir State.

There is a Tower of Silence for the exposure of Parsee dead at Abu Road.

MARKETS AND FOOD

JODHPORE.—The principal grain market of Jodhpore is Girdikote, which is located in the centre of the city, and near the Gulab Sagar tank. It is a large enclosure in the form of a square, having storerooms and verandahs on all sides; its enclosing wall and the buildings that surround it are of stone, and there is a fine open space in the middle. It has two main entrances, one leading to the Gulab Sagar, the other to the main bazaar. Besides grain, fresh vegetables (both imported and locally grown), fruit, and other things are exposed for sale in this market. The principal market for vegetables, fresh fruits, and flowers is, however, Dhan-mandi, the original grain market of the city (*dhan*, grain, and *mandi*, a place for its sale). Here various wares, such as shoes, "Chundris," and "Ornis," are always exposed in the evening, to attract the eye of the purchaser, when the market is frequented and purchases generally made. This market is in the form of an irregular quadrangle, enclosed with buildings of various kinds, temples, hospitals, and private houses. It can be approached from the main bazaar, and also from two other directions. Local fairs are held in both these markets at certain seasons, when they are thronged with brightly dressed people of both sexes, and present a very gay appearance.

As the principal citizens are Hindus, there is no meat market within the city walls; meat is, however, procurable from the butchers at their houses.

There are grain markets in all the large towns, and grain dealers in every village of importance. Grain is largely im-

Street, Jodhpore City.

To face page 156.

ported by rail and road in years of scarcity, and there is a great export of both *bajra* and wheat in years of plenty. There are great hoards of grain throughout the country, and much of this is buried in the ground against famine.

Bajra and *moth* are the staple food stuffs of the poorer classes, and wheat of the well-to-do. Barley, grain, maize, and *jowar* are largely consumed by the people, and rice is found in the markets in all the principal towns, although it is not grown in Marwar, nor is it in general use as an article of diet. The various grains have their season, *bajra* being considered wholesome at one time of the year, *moth* at another.

Animal food is not in general use, although most of the Rajputs and some of the other Hindus are meat-eaters when they can afford it. The flesh of the goat and wild pig is highly esteemed by Rajputs, while mutton and fowl are considered inferior, both in flavour and nutriment. The cow being sacred, beef is wholly forbidden.

Vegetables are always scarce on account of the lightness of the soil and the scarcity of water; radishes and onions are the principal vegetables of the people, and the latter are largely imported as well as grown. In the western desert the leaves and seeds of the *khejra* tree (*Prosopis spicigera*) are largely used as vegetable food.

Chillies are the principal condiment of the country; they are extensively grown and also imported.

Salt is found in abundance everywhere.

During years of scarcity, many of the people in the desert subsist on roots and seeds of grass, supplemented by locusts when they visit the country. Meal made from "Bhurat" grass seed (*Cenchrus catharticus*) is not unlike *bajra* meal; but great labour is entailed in separating this grass seed from its horny case: it is said that a man has to work hard for a whole day to obtain sufficient meal for three days' food. When locusts make their appearance, which they frequently do, they are

caught in great numbers by throwing sheets and blankets over them when they are huddled together during the cold of the early morning; they are carried off in bags on camels and used fresh, or, when abundant, salted up in tiers in the corners of the huts, for future use. They are said to be both wholesome and palatable when so preserved, and the consumers fatten on the diet.

Fruit is not largely grown, but oranges, pomegranates, guavas, and "Bor" (*Zizyphus jujuba*) are grown where water is plentiful.

Water-melons are largely cultivated in the sands, where they grow to an enormous size. The pulp is eaten fresh, and the seeds are dried, ground, and mixed with flour for food. There is a large import of fruit into some of the towns.

Mango pickle is much in use as an antiscorbutic.

Tobacco is in general use, and it is both grown and largely imported.

Liquor is largely consumed throughout Marwar by many of the well-to-do, and opium is in general use, both as an occasional beverage and as a daily stimulant.

Sirohi.—There are many grain-dealers and markets in the Sirohi capital and in the principal towns, but most of the people grow their own supplies. Wheat, barley, *gram*, *mong*, *jowar*, and maize are more in use in this State as food stuffs than *bajra* and *moth*, although the latter are grown and consumed in some parts of the country. Vegetables and fruit are more plentiful than in Marwar and Jaisalmir; melons are largely grown in the beds of streams and rivers, and country vegetables are to be found in most villages, while cabbages, carrots, and other English vegetables are at certain seasons to be had in many places. Fresh animal food is only in general use among some of the well-to-do. Bhils, Bhambis, and other low castes eat all animals that die, and many of the Bhils hunt to obtain animal food. The greater part of the population is vegetarian. Tobacco is grown and also imported; it

is in general use throughout the country. Many of the people, especially Rajputs, Minas, and Bhils, consume liquor freely, and opium is much used both as a beverage on great occasions and by *habitues* of the drug. Hemp is used only by a few, and it is cultivated to some extent for both local consumption and export.

JAISALMIR.—There is a market in the city of Jaisalmir, and in all the principal villages a few dealers in grain, who supply the people during times of famine, when food stuffs have to be imported. Under favourable monsoon conditions, most of the people grow their own food.

Bajra is the principal food stuff produced, but wheat, *jowar*, and *mong* are grown in good seasons; milk enters largely into the diet of the people. Radishes and chillies are grown in a few favourable spots, but the *khejra* tree (*Prosopis spicigera*) is the principal source of vegetables in many parts of the country. Water-melons are grown in some parts of the sandy desert. There are a few limes and oranges grown near the capital, and in a few other places where water is procurable; but fruit is little known in the country. Sugar is largely imported, and opium is much used, both as an occasional beverage and by *habitues* of the drug. There is not much wine consumed in the country, but it is much relished by many of the people when they can get it, and used regularly by a few who can afford it. Salt is found in several places throughout the country, but it is not manufactured on a large scale; most of that used is imported from Marwar, where it is of superior quality. Tobacco is in general use, but it has mostly to be imported, as there is no part of the country where it can be grown as a paying crop.

As in the desert parts of Marwar during times of scarcity, many of the people subsist on the roots and seeds of grass, and locusts are much prized as an article of diet, both in the fresh and preserved state.

FOOD GRAINS

The following table shows the average prices of food grains sold in Jodhpore from 1887 to 1898, both years inclusive (shown in seers and chattacks per rupee).

Year.	Wheat.		Barley.		Maize (Maki).		Remarks.			
							Comparative Rates.	Death Rate.	Sickness.	Rainfall.
	Srs.	Chs.	Srs.	Chs.	Srs.	Chs.				
1887	11	15	21	$8\frac{1}{3}$	16	4	Bajra cheap; others average.	.. ...	.....	Very small.
1888	11	6	18	0	19	1	Wheat average; others cheap.	.....	.....	Above average.
1889	13	5	14	$10\frac{1}{2}$	15	$7\frac{1}{2}$	Average.	.....	.....	Small.
1890	14	4	17	$12\frac{1}{2}$	19	0	Cheap.	.....	Very healthy.	Average.
1891	12	$1\frac{1}{3}$	15	$10\frac{1}{2}$	15	6	Average.	.....	Very healthy.	Small.
1892	8	$6\frac{3}{4}$	13	$1\frac{1}{4}$	13	6	Dear.	.....	Malarial fever; unhealthy.	Above average.
1893	13	2	18	11	16	11	Cheap.	.....	Much malarial fever; very unhealthy.	Heavy.
1894	15	$10\frac{1}{4}$	18	9	19	$8\frac{1}{2}$	Very cheap.	Highest.	Unhealthy.	Above average.
1895	12	$9\frac{1}{4}$	14	$12\frac{1}{3}$	16	2	Average.	Very high.	Malarial fever; unhealthy.	Little below average.
1896	9	0	11	3	13	5	Very dear.	High.	Fairly healthy.	Little below average.
1897	10	$1\frac{1}{2}$	12	$9\frac{1}{6}$	12	$9\frac{2}{3}$	Dear.	Low.	Feverish; unhealthy.	Above average.
1898	11	$6\frac{2}{3}$	15	0	15	9	Average.	High.	Very healthy.	Small.
Total . . .	143	$3\frac{1}{2}$	191	$7\frac{7}{12}$	192	$5\frac{2}{3}$	.....	.....	.....	.....
Average . .	11	15	15	$15\frac{1}{4}$	16	$0\frac{1}{2}$	.....	.....	.....	.....

Note.—The sickness has been calculated on admissions for the following complaints:—Fevers, cholera, dysentery, diarrhœa, and diseases of the respiratory system.

The following table shows the average prices of food grains sold in Sirohi from January 1888 to December 1898, both years inclusive (shown in seers per rupee).

Year.	Wheat.	Barley	Maize (Maki).	Remarks.			
				Comparative Rates.	Death Rate.	Sickness.	Rainfall.
	Seers.	Seers.	Seers.				
1888	10	15	18	Dear, except maize.	.....	.....	.....
1889	11	16	14	Dear, wheat average.	.....	Very healthy.	.....
1890	14	20	18	Cheap.	.....	Little malarial fever.	.....
1891	10	16	13	Dear.	.....	Very healthy.	Little below average.
1892	$9\frac{3}{4}$	15	14	Dear.	.....	Not so healthy.	Heavy.
1893	12	18	15	Average.	.....	Unhealthy.	Very heavy.
1894	15	30	24	Very cheap.	Low.	Very unhealthy.	Above average.
1895	11	20	17	Above average.	Highest.	Fairly healthy.	Very low.
1896	$7\frac{1}{2}$	11	13	Very dear.	Very high.	Fairly healthy.	Little below average.
1897	10	17	15	Below average.	High.	Healthy.	Below average.
1898	12	20	18	Cheap.	Low.	Very healthy.	Very low.
Total . . .	$122\frac{1}{4}$	198	179	.....	.....	.....	.....
Average . .	11.18	18	16.27	.....	.....	.....	.....

Note.—The sickness has been calculated on admissions for the following complaints:—Fevers, cholera, dysentery, diarrhœa, and diseases of the respiratory system.

The following table shows the average prices of food grains sold in Jaisalmir from January 1889 to December 1898, both years inclusive (shown in seers and chattacks per rupee).

Year.	Wheat.		Bajra or Millet.		Jowár.		Remarks.			
							Comparative Rates.	Death Rate.	Sickness.	Rainfall.
	Srs.	Chs.	Srs.	Chs.	Srs.	Chs.				
1889	10	6	11	6	12	13	Dear except wheat.	.....	.....	Above average.
1890	11	10	14	5	16	5	Cheap.	.....	Little malarial fever; very healthy.	Much below average.
1891	10	7	14	5	16	4	Cheap.	.....	Very healthy.	Low.
1892	8	6	12	8½	13	10½	Dear.	.....	Malarial fever; unhealthy.	Much above average.
1893	12	7	18	9½	19	4½	Very cheap.	.....	Very unhealthy.	Heavy.
1894	13	10	19	11	23	4	Very cheap.	Very high.	Unhealthy.	Much above average.
1895	11	4¼	13	6¼	15	12½	Above average.	Very high.	Little malarial fever; very healthy.	Very low.
1896	8	13	10	1½	11	0¼	Very dear.	Highest.	Little malarial fever; very healthy.	Very low.
1897	7	3½	9	0¾	9	9	Very dear.	Low.	Very feverish and very unhealthy.	Much above average.
1898	10	12¾	12	10½	13	6	Dear except wheat.	Low.	Very little malarial fever; very healthy.	Very low.
Total . . .	104	15½	136	0	151	4¾	.....	.....	.....	.....
Average . .	10	8	13	10	15	2	.....	.....	.....	.....

Note.—The sickness has been calculated on admissions for the following complaints:—Fevers, cholera, dysentery, diarrhœa, and diseases of the respiratory organs.

Sambher, Chiloe, Black Buck, and Red Buck.

To face page 163.

GAME

The game of these States is intimately connected with the food-supply. The Rajputs are keen sportsmen, and shoot and hunt the game of the country both for sport and for the table. Game is much prized by them, on account of its flavour, as well as on account of the strengthening and nutrient qualities assigned to it beyond other animal food. Flesh, especially that of game-birds and antelope, is added to the ingredients from which superior country wine is distilled, and it is believed to give body to the distillate, and to counteract the evil effects of the ardent spirit, so that it can be consumed in larger quantities with less detriment to health than other alcoholic drinks, although it is generally much stronger and not often carefully mellowed by keeping, as is done in the case of the superior wines of the West.

The Indian wild boar (*Sus indicus*) stands first among the game of these States, as the pig-sticking of Jodhpore is far-famed. Wild pig are not only found in great numbers in the low hills adjacent to Jodhpore, where they are carefully preserved, but they abound in many other parts of Marwar, especially in the low ranges of the Aravallis and the grass lands of Godwar and Jalore, where they are protected by the ruggedness of the country and the natural cover afforded by the low scrub jungle in uncultivated regions. Wild pig are found in a few places in Jaisalmir, and they are numerous in most of the low hills of Sirohi. Although the wild boar in this arid country does not attain the same proportions to which he grows in the sugar-cane fields of the Deccan, yet large animals

are common in the preserves, and they are noble for sport, being fast in their own ground, and, when overtaken, fighting till the last breath. Boars, measuring 36 inches at the shoulder, are not uncommon here, and they occasionally run to a couple or three inches more. No year passes here without a number of accidents in the pig-sticking field to both men and horses, and the wounds are often severe, as the boars charge with great courage, frequently overturning both horse and rider, and following up with a most determined attack upon the horseman who has been unseated. I have seen a boar in the preserves at Jodhpore unseat two excellent horsemen, one after the other, and then cut the horse of a third in the quarter behind the saddle, after which the game animal rushed on to a number of spears pointed at him, and died charging. On another occasion a rider engaged in spearing a pig was attacked from behind by a second boar of the same sounder, and dragged from his saddle, badly cut and torn. Indeed, the wild boar of these parts will at certain seasons attack a horseman as soon as they see him approaching, and the old animals will often charge their pursuers before they are touched with the spear. I once shot a tiger in the Sirohi preserves which had been badly wounded by a wild boar; and the latter is almost the only animal in the jungle that will not slink from his path to avoid a tiger. Spearing the wild boar is a very favourite sport with good horsemen, and the Rathore is a particularly keen and accomplished pig-sticker. The sport is attended with more danger than fox-hunting, both hands and head are more occupied in self-preservation and attack, the excitement of the chase is more intense although sooner over, and greater dash is required. Consequently, many hunting men who have done much in both fields of sport place pig-sticking in front of fox-hunting. There are, however, on the other hand, keen sportsmen who prefer a day with the hounds, but the associations would probably account for this.

Pig-sticking—The Kill.

Pig-sticking—The Bag, Jodhpore. *To face page* 164.

Pig-sticking is a most healthful recreation. It gives a horseman a good seat, a keen eye, a ready hand, and a clear head. I therefore prescribe an occasional morning with the wild pig for the overworked administrator to ward off dyspepsia, as well as to the soldier officer to keep him in health and condition and ready for the actual practice of his profession. The flesh of the wild boar is much prized by all Rajputs as an article of diet, and, when roasted in their way, it is very palatable and nourishing, and the hams cured and cooked in Europe fashion are of excellent flavour. The fat is much used by Baids and Hakims in the treatment of disease, and the teeth are worn by children to keep off the evil eye.

Four varieties of antelope are found in these States, viz., the Indian antelope or black buck (*Antilope bezoartica*); the Indian gazelle or Chikara (*Antilope arabica*); the four-horned antelope or Bekra (*Antilope quadricornis*); and the nilgai (*Antilope tragocamelus*). The black antelope is found in abundance in Marwar and Sirohi, between Abu and Sendra, west of the Aravallis. It extends south into the parganas of Jalore and Siwáná, west into Pohkaran and Phalodi, and north into Merta, Nawa, Nagore, and Didwáná. It is found in Báp and some adjacent parganas of Jaisalmir, but it does not frequent the western and north-western deserts of Marwar and Jaisalmir. Black buck grow to a good size in these States, although their horns are not so long as in Ulwar, Bhurtpore, and Dholpore, rarely exceeding 24 inches. Black buck afford good sport to the rifleman. They are shy and difficult of approach, consequently they require stalking, and cannot be obtained without labour. The flesh of the black buck is highly prized by Rajputs. The horns are used for handles for knives, and the skins as foot-mats.

Red buck, Indian gazelle or Chikara, are abundant throughout the Western States of Rajputana, except in the highest hills, and although they are smaller in the sandy and hard

desert than in the fertile plains below the Aravalli range, there is but one species. The horns rarely measure over 13 inches. Red buck are much more easily approached than the black variety, and they are hunted with dogs as well as shot. The flesh is more finely flavoured than that of the black buck, and the saddle is particularly tender and well-flavoured when properly kept.

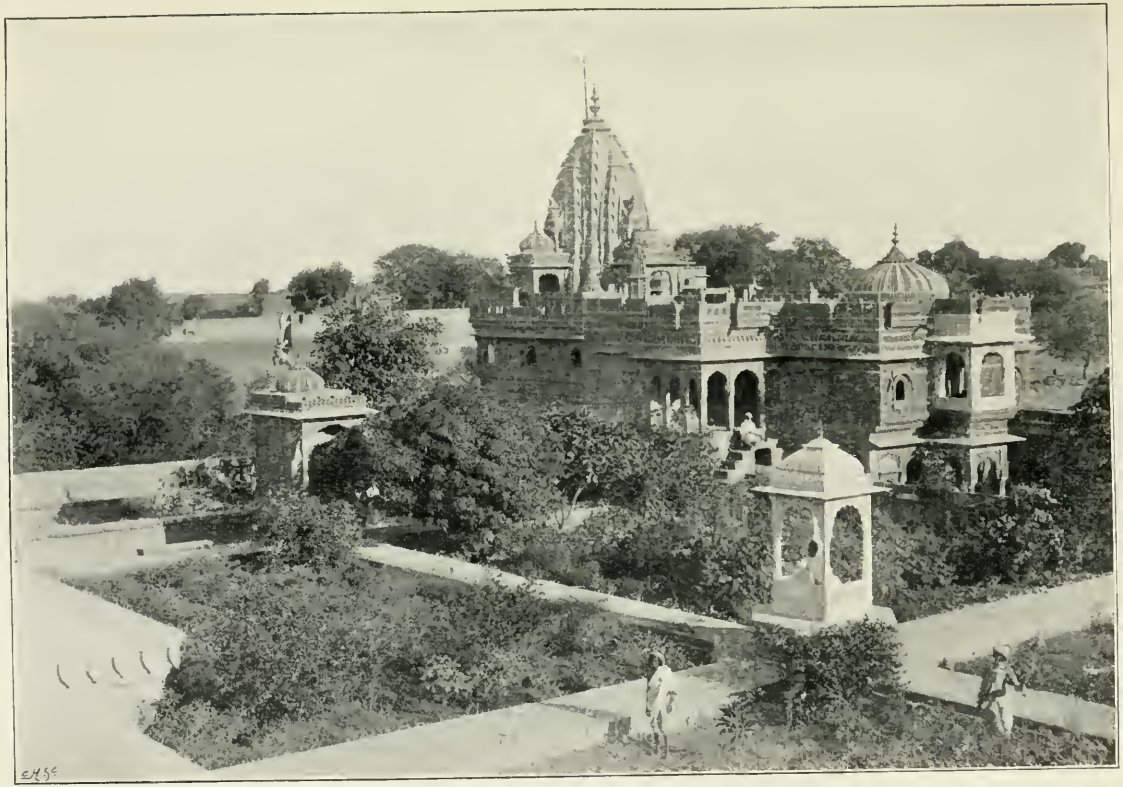
The four-horned antelope or Bekra is met with on Abu, in the Aravalli range, and in some of the detached hills in Marwar and Sirohi. It is not of much importance from a sportsman's point of view, and its flesh is less finely flavoured than that of the other species.

The nilgai is found in several of the northern and eastern parganas of Marwar. It is rarely seen in Sirohi or Jaisalmir. It is not very attractive to the sportsman, and the villagers look upon it as a sort of cow, and would resent its being shot. The hide of the nilgai makes excellent soft leather, and its marrow-bones are a great delicacy.

Two varieties of deer are met with in the Aravalli range, Abu, and other hills of Sirohi and Marwar, viz., Samber (*Cervus hippelaphus*), and Chital (*Cervus axis*).

The samber is met with in considerable numbers on Mount Abu, the Neemuch and Jaswantpura hills, in the Aravalli range, at Kuchawan, and in some other places in Marwar and Sirohi. The animal is well grown in these hills, and has often horns approaching a record. Major Hutton Dawson, of Kotra, has a pair of samber horns the measurements of which are near the published record; the animal was shot in the low hills near Kotra. The flesh is considered good by the people of the country, the marrow-bones are excellent, and the skin is much prized for sword-belts, boots, and leggings.

The chital, or spotted deer, is found in the south of Sirohi, and close to the Aravallis in Marwar, but not often in great numbers. It is not found in Jaisalmir. It is a well-



Temple, Jaisalmir.

To face page 166.

grown animal in these States, and shot for its flesh, skin, and horns, as well as for the sport it affords. Deer horns are used medicinally in the treatment of pleurisy. The skins of all varieties of deer are highly appreciated by Sádhus as mats, and by others for making belts and slippers.

The common Indian hare (*Lepus ruficaudatus*) is distributed throughout these States, and met with in great numbers along the foot of the Aravalli range, and adjacent to the low hills, as well as in most other parts of Marwar, Sirohi, and Jaisalmir. Hares are hunted with village dogs, and mobbed by the villagers of some parts, but they are generally shot by Rajputs, who prize their flesh for the table. Jugged Indian hare is very palatable. *Lepus nigricollis*, another variety of Indian hare, is very rarely met with in the Western Rajputana States. Hares' blood is used medicinally, especially for children's diseases.

The porcupine (*Hystrix cristata indica*) is met with in great numbers adjacent to hills and tanks. It is killed and eaten by some of the people, but is generally destroyed on account of its depredations in vegetable gardens. Its fat is used medicinally in rheumatic and other affections, and its quills are in use as pen-holders and boring instruments.

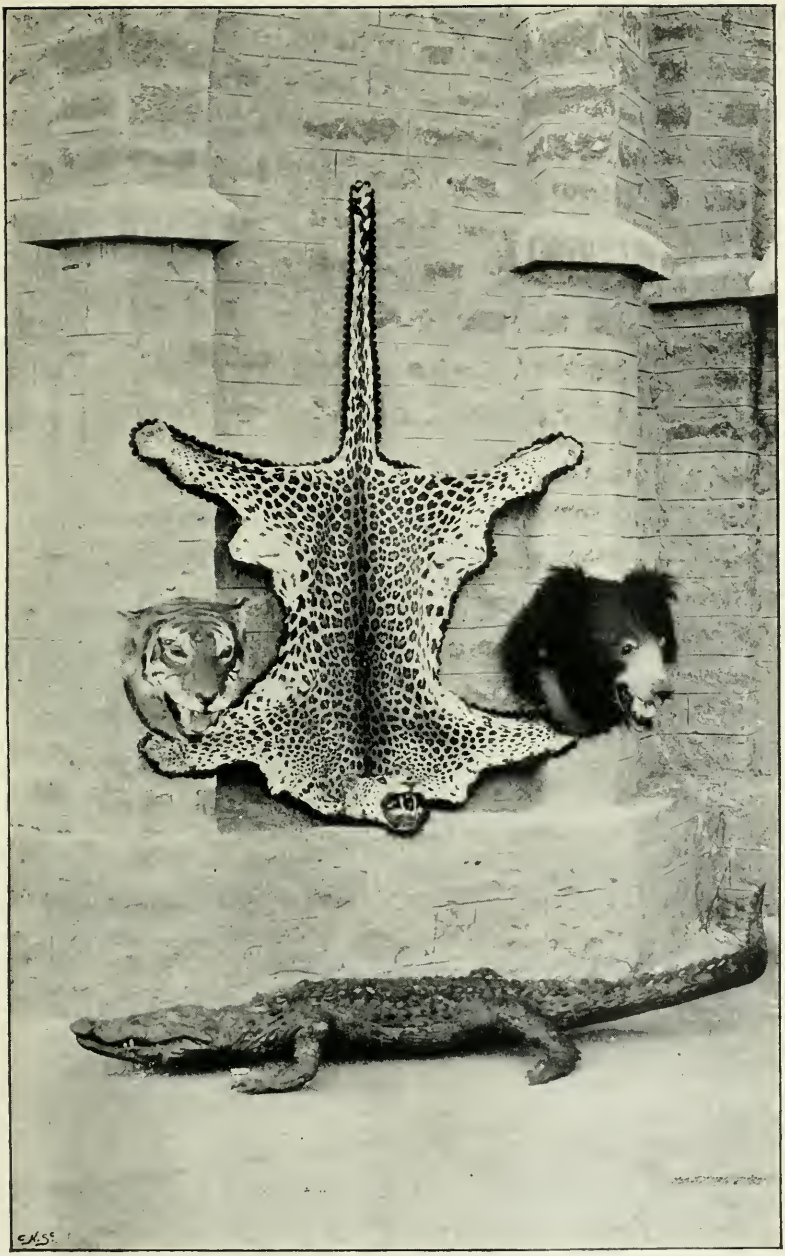
The hedgehog (*Erinaceus collaris*) is common. It is smaller than the English hedgehog, but the same in appearance and habits. It feeds on small animals and vegetables, and sometimes does injury to young vegetables and flowers. It is eaten by some low castes. Hedgehogs' fat is used medicinally in joint affections and lumbago.

BIG GAME

A BRIEF account of the animals, mostly known as big game, which diminish the food of man, and others which are injurious to man and domestic animals, will be appropriate here. I shall begin with those which delight the sportsman, even more than the game shot to supplement the delicacies of the table.

The lion (*Felis leo*) has now become extinct in these States, no specimen having been shot in either Marwar or Sirohi for nearly thirty years. In 1872 the Bhil Shikári of Mr. T. W. Miles brought in the skin of a full-grown Asiatic lioness which he had shot on the Anadra side of Mount Abu, and about the same year Colonel Hayland bagged four of the species near Jaswantpura, in Marwar. These were the last lions seen over the Kutch border of Marwar, and the Abu lioness was the last met with in Sirohi territory. They seem to have been more easily shot than tigers, as they returned more boldly to their "kills," thus becoming an easy prey to the Bhil Shikári who sat up for them.

The tiger (*Felis tigris*) is still to be found in many parts of Marwar and Sirohi, although he is yearly becoming scarcer, and must shortly follow the fate of the lion, and cease to belong to the fauna of these jungles. Tigers have not been known in Jaisalmir during recent years, and there is hardly any place in the State where they could find cover enough to exist, even if preserved. Tigers in Marwar and Sirohi are now mostly confined to the Jalore, Jaswantpura, Nimuch, and Abu hills. There are, however, still a few in the Aravalli range, and in



Big Game—Tiger, Bear, Panther, and Crocodile. *To face page* 168.

the lower hills of Sirohi; but these could now be easily counted, and are hardly allowed sufficient rest by the Shikáris to breed. The tigers of these parts are generally well grown, and they give good sport, sometimes charging before they are wounded. The largest I have shot, and indeed the biggest I have seen, measured 9 feet 9½ inches, as it lay before the skin was taken off. The tigers here live principally on the game of the jungle, which is plentiful in their beats, but they also carry off many of the cattle from the large herds grazing on the hills. They even sometimes kill camels, horses, and other domestic animals which wander a little way from villages. Tigers' fat is considered a potent remedy in the treatment of rheumatism and joint affections, and the skin is highly prized as a mat by all classes.

The panther (*Felis pardus*), of which there are undoubtedly two varieties in these States, viz., the large long-headed and the small round-headed. They are both still fairly plentiful in the hills of Marwar and Sirohi, and panthers are even met with occasionally in a few places in Jaisalmir. The large panther is destructive to sheep, goats, and cattle, and will sometimes kill ponies and camels, while the smaller variety confines itself chiefly to sheep and goats. The latter is occasionally an accomplished dog-stealer, being able to carry off fox-terriers, almost from their masters' feet, when taken out for a walk at Abu. Sometimes the larger variety takes to dogs also, and will make the boldest and most determined attacks on well-nourished Europe dogs, as well as lie in wait for the village dog outside the door. Both varieties of panther exercise much greater cunning than the tiger in evading the sportsman, and are always a much less certain find, even when they have killed and eaten well. Consequently they will exist long after the tiger has been added to the extinct genera of felidæ. Panther skins are much sought after by Sadhus, for use as praying carpets.

I have not seen or heard of the hunting leopard (*Felis jubata*) in the wild state, in these jungles. When met with, domesticated for hunting, it has invariably been brought from beyond our border.

There are at least four varieties of wild cats met with in these States, viz., the marbled tiger-cat (*Felis marmorata*), the leopard-cat (*Felis bengalensis*), the common jungle-cat (*Felis chaus*), and the common tree-cat (*Paradoxurus musanga*). These cats do much harm to small game and poultry, and should be destroyed when opportunity offers.

The red lynx (*Felis caracal*), the hyæna (*Hyæna striata*), two varieties of mungoos (*Herpestes malaccensis* and *rubiginosus*), the wolf (*Canis lupus*), the jackal (*Canis aureus*), the wild dog (*Cuon rutilans*), and the desert fox (*Vulpes leucopus*), are all fairly numerous in these States. Hyænas are found in the low hills and ravines here, where they do much harm to the flocks and young of the herds. Wolves are abundant in the Western desert, and are much dreaded by the people. They hunt in packs, and carry off sheep, goats, calves, and even young children from the fields. Jackals abound everywhere, and do much harm to game, poultry, and young animals. Wild dogs are only occasionally met with in these forests; but when they appear they commit great ravages among deer and other animals, soon leaving the country without horned game. Both jackals and wild dogs hunt in packs, and the latter are very ravenous beasts. The desert fox is found everywhere in the deserts of these States, where it lives on rats, eggs, and young birds. It cannot be hunted successfully here, as the dogs get foot-sore and become unable to run, on account of the spiked grass-seed which covers the sandy desert in years of good rainfall. Camel men are always anxious to get foxes and jackals, which they boil and give to their camels to increase their pace and power of endurance.

The Indian black bear (*Ursus labiatus*) is found in the

Aravalli range and throughout the low hills of Sirohi, Jaswantpura, Jalore, and sometimes in the Siwana hills of Marwar. The black bear of Sirohi and the hilly parts of Marwar generally resorts to a cave in the daytime, only coming abroad from evening till morning, for food and water. It is consequently difficult to bag by beating the ravines and hills, and will therefore survive for a considerable period longer. This bear is well grown, and I have seen some specimens equal to those met with in the Deccan, where their food is more easily obtained. Bears feed principally on fruit and honey, and there is a good supply of the latter to be had in the Aravallis and other hills of these States. Bears' fat has a reputation as a curative remedy in rheumatism, and the skin is used as a mat.

The Indian badger (*Mellivora indica*) is rarely seen in these States, but the Indian otter (*Lutra nair*) is common, and may at times be seen about most large tanks, where it lives principally on fish. The skin of the Indian otter is not valuable, as the fur is coarse and wanting in the gloss of that of animals of the same species resident in cold climates.

The Indian Shikári or sportsman runs considerable risk in his conflicts with the big game of the country, and often when wounds inflicted on man by wild animals are not at first mortal, they rapidly take on a poisonous character and frequently end fatally. This is due to inoculation with saliva and to blood poisoning. Even the claws of the felidæ sometimes produce poison wounds. Most of the accidents connected with big game shooting occur after the animal has been wounded, and when it is in a high state of anger, which increases the poisonous character of the saliva and enhances the danger of wounds made by the teeth. That the saliva of animals increases in virulence, as a provision of nature for self-preservation, has been well established; and that mothers can, under conditions of great irritation, secrete a poisonous milk injurious to their offspring, is also well known. The late Maharaja of Jodhpore,

who was a great Shikári and a keen observer, told me that he had noticed that the bites inflicted by old tigers and panthers were always more likely to be followed by blood poisoning than those of younger animals. This could be accounted for by the fact that the old ones would no doubt generally be in a greater rage when wounded than the young animals, and consequently be secreting a more virulent saliva to use against their enemies.

Of such importance is the early cleansing and disinfection of wounds made by wild animals that no Shikári should be in pursuit of big game without having some antiseptic convenient, and carbolic acid is the safest and most easily applied. Deep wounds made by the teeth should be at once attended to, and they should be immediately mopped out with strong carbolic acid on a piece of cotton attached to a bit of clean wood for a handle, which can be made anywhere. The cavities should then be washed, or, better still, syringed out with carbolic lotion, of the strength of one part of the acid to fifteen of clean, and, if possible, boiled water, after which iodoform dressing should be applied, if it be available. Should, unfortunately, no medicines be procurable, the wounds must be thoroughly washed, the limb placed in an easy position, and the nearest medical aid obtained. Hæmorrhage is sometimes troublesome, but it can generally be controlled by elevating the limb and keeping the patient in the recumbent position. The application of ice, very cold water, hot water, and the pressure of a pad of clean cotton, fixed by a clean handkerchief, which would always be available, may sometimes be necessary. The shock is often very great, and stimulants are occasionally craved for; liquor should, however, be given with great caution, especially in the hot weather, when big game shooting is done, and when most of the accidents occur. Whisky and brandy should be well diluted with water, and, when required, given in small quantities, frequently repeated, rather than in large draughts at longer intervals. The greatest care should be taken to prevent

contamination of the wounds by flies or dirty clothes, and the water used for washing should be boiled and then cooled, when possible.

The common striped squirrel (*Sciurus palmarum*) is very common everywhere, and has almost become a domestic animal. Other varieties of this family are very rare in these States.

There are five varieties of rats and mice commonly found here, viz., the desert jerboa rat (*Gerbillus erythrourus*), the brown rat (*Mus decumanus*), the white-bellied house rat (*Mus niveiventer*), the bandicoot rat (*Mus giganteus*), and the common Indian mouse (*Mus urbanus*). The jerboa overruns the desert, and digs up the ground in all directions, making granaries in the sand against scarcity. The ordinary brown rat is found in and about houses. A large variety of brown rat, the antelope rat, occasionally overruns this part of the country, sometimes destroying most of the crops, when green, by eating the roots; at other seasons, when the crops are in ear, devouring most of the heads of grain. These migratory rats come in numbers in occasional years, and then disappear from the country completely (like locusts) when they have devastated the crops.

The common musk shrew (*Sorex cærulescens*), known as the musk rat, is frequently met with in houses at Mount Abu, and it is also fairly common in the plains of these States.

There are several varieties of bats met with, both in the hills and plains, the best known of which are the following:— The large fox bat (*Pteropus medius*), or the flying-fox; the small fox bat (*Pteropus pyrivorus*); the vampire bat (*Megaderma lyra*); the coromandel bat (*Scotophilus coromandelianus*); the Indian horse-shoe bat (*Hipposideros speoris*); and the tailed bat (*Rhinopoma hardwickii*). The fat of the flying-fox is used as a medicine in joint affections, and the flesh is sometimes given to camels to increase their pace.

The Indian scaly ant-eater (*Manis pentadactyla*) is met with both in the desert and at the bases of the lower hills, where it

makes holes in the ground, and rarely comes abroad in the daytime. It feeds chiefly on white ants (*termites*). Its skin is much prized for making small drum-heads.

There are two varieties of crocodile (*Crocodilus indicus*) met with, a large and a small. Both are numerous in large tanks, where they live on fish and animals which come down to the water to drink, man occasionally becoming a victim to their voracity.

There are several varieties of lizard (*Lacerta*) met with, and the chameleon is found in the forests of Mount Abu and some of the other hills. The small brown lizard is a most useful creature in the house, preying upon moths, mosquitoes, and house flies. None of the ordinary lizards have a poisonous bite; nevertheless, their wounds often suppurate and are troublesome to heal. Although it has been established that no lizard has anything resembling a poison gland or hollow fang for injecting virus, and that even the *Heloderma horrida* of South America, the most poisonous lizard, is only so by virtue of the virulence of its saliva, there is a firm belief among the people that a species of lizard, known as the *Biscobra*, exists, and that not only is its bite deadly, but its breath is fatal to man and animals on which it is blown. This fabled lizard still occupies the place here which the cockatrice (*Basiliscus mitratis*) held among the ancients, although it is not reproduced in any abnormal way like its prototype.

Two varieties of frog (*Rana palustris* and *pipiens*) are met with. They add greatly to the food-supplies of the snake tribe, and are a danger in attracting the latter when they come into our bathrooms in search of moisture.

There are four species of poisonous snake very common in these States, two of which belong to Colubridæ, viz., the cobra (*Naia tripudians*), and the "Krait" (*Bungarus cæruleus*); and two to Viperidæ, viz., the echis (*Echis carinata*), and

daboia (*Daboia russellii*). Several varieties of *trimeri* also exist, but not in such numbers. The python is found in the hills and occasionally in the plains below; also the rock snake, which resembles a large cobra without the hood, and which is non-poisonous.

In the desert, snakes live principally on the jerboa rat, and some of them keep so much underground in rat-holes, that they become pale and look like a new species.

Mount Abu has many snakes, but the hill is so favoured that few of them are poisonous. Some devotees believe that the patron saint of the holy mountain, like St. Patrick in the Emerald Isle, enticed the venomous reptiles into a hollow cave and sealed them up permanently, or, that he expelled them from the hill so that they should not be a trouble to the many pilgrims who frequent the place. However, a cobra has occasionally been seen, and the echis is sometimes met with, in the monsoon season; both these snakes are much rarer in Abu than in the country below, and there is undoubtedly something uncongenial to them on the hill.

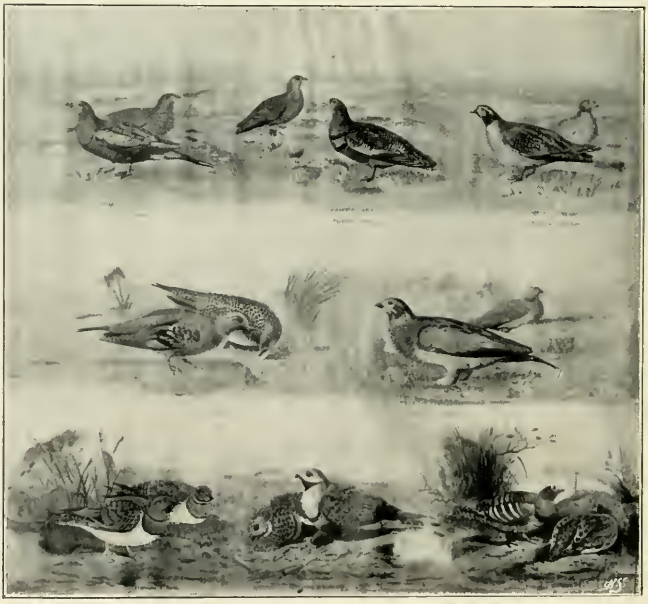
The mortality from snake-bite is considerable in these States, and, till quite recently, we had nothing in the way of a curative remedy that could be relied upon, when a full dose of cobra or viper poison had been injected and absorbed into the circulation. Professor Fraser of Edinburgh, after long research in this direction, has, however, discovered that immunity can be conferred on animals by injecting gradually increasing doses of snake poison into their tissues. They can be thus trained to withstand many times the lethal dose of the venom, and the serum of these animals, when injected into the blood of non-immune animals, protects the latter against snake poisoning. Dr. Calmette of the Pasteur Institute has also worked in this direction, and produced a serum from the blood of horses rendered immune by injections of the non-coagulable proteids of cobra venom, which is curative.

This antivenine is now being used as a prophylactic against snake poisoning, and promises well. Antivenine can be had in India without difficulty, and can be injected with an ordinary hypodermic syringe. The remedy should, if possible, be injected into a vein, as it acts more quickly than when injected into the subcutaneous tissues, and immediate action is of great importance in dealing with snake-bite.

When a person has been bitten by a snake a tight ligature should immediately be placed above the punctures made by the fangs, and a second ligature at a convenient distance above the first to stop the circulation in the limb and prevent absorption of the poison. The punctures should be freely incised and the blood pressed out of them with the fingers, while a stream of slightly tepid water is poured on the part to encourage bleeding and to wash out the poison. The patient should be kept quiet in a well-ventilated room, and stimulants given to support the strength until medical aid can be procured. When a soft part has been bitten, it should be cut out as soon as possible, as much of the venom may be removed with the portion of flesh, and some may be washed out by the bleeding which ensues.

There are two varieties of scorpion (*Scorpio fulvus* and *fuscus*), and one common centipede (*Scolopendra communis*), commonly seen here. The best remedy for relieving the pain of scorpion sting is a poultice of powdered ipecacuanha saturated with chloroform. The seat of pain should be well washed with chloroform while the poultice is being prepared. Ipecacuanha wine, alcohol, opium, cocaine, honey, indigo, ammonia, and æther also relieve the pain to some extent.

Teal.



Grouse.

To face page 177.

FEATHERED GAME

THERE are but few game-birds which remain in these States throughout the year, both on account of the scarcity of water and the heat of summer; however, the winter visitants are varied and very numerous, and good small game shooting is always to be had in normal years during the cold months.

The great Indian bustard (*Eupodotis edwardsi*) may be considered indigenous, as it is found at all seasons when grass is abundant; it would appear to quit the country altogether only for a time in years of grass scarcity, or absolute famine. It is met with in great numbers in various parts of the desert, in good seasons, and its flesh is finely flavoured throughout the cold months, but it is tough and often coarse flavoured if shot at other times of the year. The feathers of the neck and back of this bird are very valuable for fishing,

There are two indigenous species of sand-grouse met with throughout these States, viz., common sand-grouse (*Pterocles exustus*), and painted sand-grouse (*Pterocles fasciatus*). They are common both in the sandy and stony deserts of Marwar and Jaisalmir, and are found along the foot of the Aravalli range, close to the base of Mount Abu, and all the other hills of Marwar and Sirohi. The common grouse can be found in numbers in the cultivated fields, while the painted grouse frequents low stony hills. Both varieties afford good sport, and are well flavoured when hung for a time before being cooked.

Three varieties of partridge are indigenous, viz., grey partridge (*Ortygornis ponticeriana*), painted partridge (*Francolinus*

pictus), and black partridge (*Francolinus vulgaris*). Grey partridge are found everywhere throughout these States, and they are even plentiful in most parts of the desert. They are also found in abundance in Godwar, and parts of Sirohi in the scrub jungle, where they give much better sport than in bare ground where they run. Painted partridge are found in numbers throughout the grass lands of Sirohi and Marwar, along the foot of the Aravallis. They afford excellent sport, and are gamy and well-flavoured when properly hung. Black partridge are not met with in great numbers, but there are a few places in Marwar where they can generally be found, viz., in the Bhinmal, Jaswantpura, and Khajwáná districts.

A few varieties of bush quail are indigenous, and frequent the grass lands and scrub jungle under the Aravallis, Abu, and other hills. They are also found throughout the year along the beds and banks of rivers, viz., jungle bush quail (*Perdicula cambayensis*), rock bush quail (*Perdicula asiatica*), painted bush quail (*Microperdix erythrorhyncha*), and Indian button quail (*Turnix joudera*). None of these varieties afford much sport, nor are they of much use for the table when shot.

Three varieties of jungle fowl are met with in the Abu and Aravalli hills, and they are indigenous, viz., grey jungle fowl (*Gallus sonneratii*), painted spur fowl (*Galloperdix lunulosus*), and red jungle fowl (*Gallus ferrugineus*). Grey jungle fowl are numerous in the low hills around Abu and the base of the Aravalli range, wherever water is abundant. They are very wary birds, and difficult to shoot. They can, however, be readily seen late in the afternoon at most of the jungle pools of water about the low hills, when they come down to drink. Spur fowl are common all over Abu, the Aravalli range, and other hills of Sirohi and Marwar, and they are less shy than jungle fowl; however, on account of their size and their habit of calling, when they run about the dense jungle in the mornings and evenings, they can often be more easily heard than

Partridge.

Jungle Fowl.

To face page 178.

seen. Red jungle fowl are much more rare than the above varieties. They frequent the low hills around Abu and along the Aravalli range, and are generally seen in thick jungle near water. The flesh of both jungle and spur fowl is dry, and requires hanging. They do not give good sport, as they are difficult to flush from the thick undergrowth, into which they run at the first appearance of danger. The hackles of some of the jungle cocks are very brilliant, and are useful for fishing.

The large grey or spotted-bill duck (*Anas pœcilorhyncha*) is indigenous; but, as most of the tanks of these States frequently dry up completely for some months of the year, there are times when a specimen could not be procured. This duck, however, reappears early in the rains, and remains throughout the cold weather.

The nukhta or combed duck (*Sarcidiornis melanonotus*) is an indigenous species, but hardly ever remains in these States during the hot weather, although at certain seasons it is abundant. The flesh of this indigenous duck is inferior to that of most of the winter visitants.

Both varieties of whistling teal, viz., *Dendrocygna fulva* and *Dendrocygna javanica*, are met with, but only during the cold weather; they must therefore be considered winter visitants here, as they nest in the Deccan and in other parts of India. Even in the cold weather they are not often met with in great numbers in these States, and they rarely come in the rains like the other indigenous varieties, viz., *Anas pœcilorhyncha* and *Sarcidiornis melanonotus*.

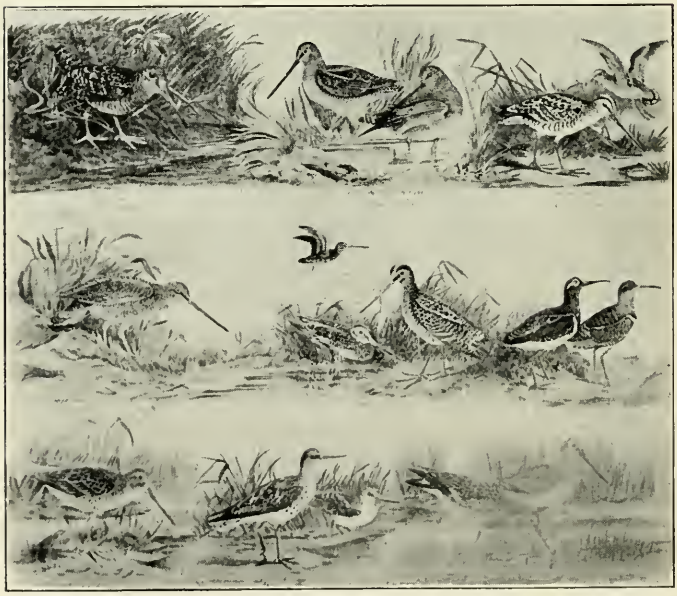
Throughout the cold weather, in seasons of ample rainfall, when the tanks and marshes of these States become well replenished, exotic duck and teal are found in abundance in many parts of the country. Besides two or three varieties of geese, and three or four varieties of snipe, also bittern, rails, plovers, and godwits are commonly met with.

The following are the winter visitants commonly seen on

tanks and marshes, viz., the gadwall or smaller grey duck (*Chaulelasmus streperus*), the shoveller (*Spatula clypeata*), the ruddy sheldrake or Brahminy duck (*Casarca rutila*), the pintail (*Dafila acuta*), the mallard (*Anas boschas*), the sheldrake (*Tadorna vulpanser*), the pink-headed duck (*Rhodonessa caryophyllacea*), the white-winged wood duck (*Anas leucoptera*), the pochard or dun-bird (*Fuligula ferina*), the red-crested pochard (*Fuligula rufina*), the white-eyed pochard (*Fuligula nyroca*), the tufted pochard (*Fuligula cristata*), the scaup (*Fuligula marila*), the smew (*Mergellus albellus*), the goosander (*Mergus merganser*), the golden eye or garrot (*Clangula glaucium*), the common teal (*Querquedula crecca*), the garganey or blue-winged teal (*Querquedula circia*), the cotton teal (*Nettapus coromandelianus*), the baikal or clucking teal (*Querquedula formosa*), the crested teal (*Querquedula falcata*), the marbled teal (*Querquedula angustirostris*), the wigeon (*Mareca penelope*), the barred-headed goose (*Anser indicus*), the grey-lag goose (*Anser cinereus*), the bean goose (*Anser segetum*), the common or fan-tailed snipe (*Gallinago cœlestis*), the jack snipe (*Gallinago gallinula*), the painted snipe (*Rhynchœa capensis*), the bittern (*Botaurus stellaris*), the snipe-billed godwit (*Pseudoscolopax semipalmatus*), the yellow-shank (*Totanus dubius*), the red-shank (*Totanus calidris*), the black-tailed godwit (*Limosa ægocephala*), the Indian water-rail (*Rallus indicus*), the purple coot (*Porphyrio poliocephalus*), the blue-breasted rail (*Hypotœnidia striata*), the white-brown crake (*Porzana cinerea*), and the blue-breasted crake (*Porzana baillonii*).

Gadwall, pintail, and mallard are the best of the winter visitants among the duck met with; they give good sport, and their flesh is delicately flavoured. The first-named variety is met with in great numbers on all the larger tanks, in normal years, throughout the cold months. Pintail are mostly plentiful also, but mallard only appear in great numbers occasionally, on particular waters, where long reeds are abundant as cover; there are, however, usually some to be seen on the larger tanks.

Bustard, Houbara, and Florican.



Snipe.

To face page 303.

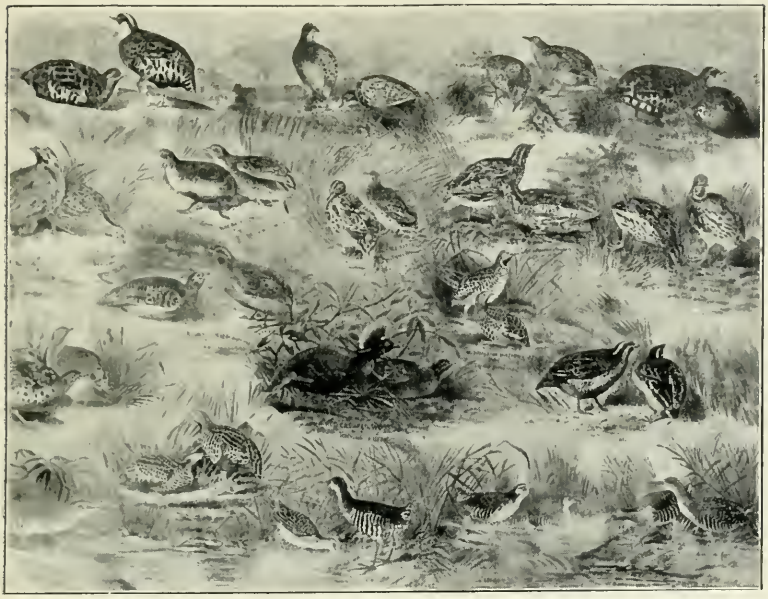
Shovellers, ruddy sheldrake, and pochards are always abundant, and they afford good sport; but they are not so good for the table as the already mentioned varieties. Pink-headed duck, belted sheldrake, white-winged duck, and smew are less common than the above varieties; the last is, however, occasionally seen in great numbers, when it visits this part of the country. The common and blue-winged teals are found in large numbers on nearly every tank of considerable size; the former is met with on nearly every pool and marsh, it is so abundant during the cold months. Marbled, clucking, crested, and cotton teal are not so numerous, even in good years; and, in some seasons, they do not make their appearance in these States. Teal are nearly always found in good condition for the table, and they afford exceptionally good sport, as they do not readily quit their habitats. Consequently, they give the sportsman frequent opportunities to shoot, even when there is not much cover or a great expanse of water; whereas large duck leave as soon as they are disturbed, under such circumstances.

The common fantail and jack snipe may be shot in considerable numbers in normal years in many marshes and tanks of Marwar and Sirohi; but snipe can hardly be said to visit Jaisalmir except an occasional stray one, as there is little suitable ground for them, even in years of a heavy monsoon. The edges of the few tanks in that State are usually dry and without grass or other suitable cover before the cold weather sets in. Painted snipe are fairly common in Marwar and Sirohi. Both fantail and jack snipe are generally found in good condition on the tanks of these States, and, early in the year, they afford good sport when there are reeds and grass adjacent to the water. However, later in the season, when the water recedes from the vegetation, the snipe sit on the bare ground and have to be stalked. The sport is then less enticing, and the bag generally small. Snipe come in here early in October, and leave again about the end of February; most of our

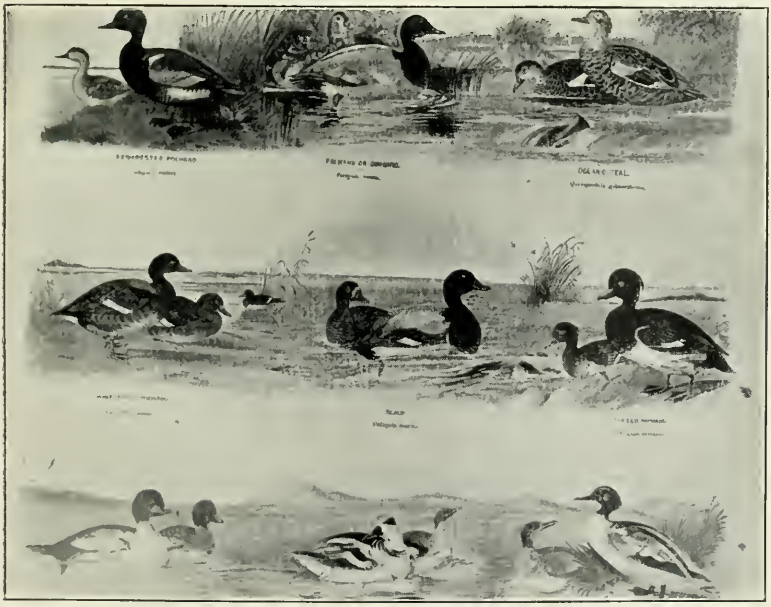
winter visitants observe the same months for coming and going.

There are three varieties of imperial sand-grouse (*Gutta*) found in the deserts of Marwar and Jaisalmir; they extend into the fertile lands east of the Luni river, and are met with in a few places in Sirohi State, although not in such great numbers. They are the black-breasted imperial sand-grouse (*Pterocles arenarius*), the spotted imperial sand-grouse (*Pterocles senegallus*), and the painted imperial sand-grouse (*Pterocles alchata*). The black-breasted grouse is found between November and March in enormous flocks in many places in Jaisalmir and Marwar. They may be seen in long lines of some thousands flying towards water in the early morning, and towards their feeding grounds in the fields in the afternoon. They rest during the day in the grass-covered valleys, and, during the hottest hours, they take the shady side of a bush. They are fine, handsome, gamy birds, flying very hard, and requiring a lot of shot to take them down. They give the best sport when coming to water, but they are very difficult to approach in the open plain. They carry off so much shot and go such a distance when disturbed that it is not easy to make a bag by following them up. The spotted and painted imperial grouse are both met with in considerable numbers in Jaisalmir during the cold months. They drink some hours later, and are more easily shot coming to water; while, at other times, they are more difficult to approach than the first variety, and they fly very high when passing overhead. They are both handsome varieties, but much smaller and less gamy in appearance than the black-breasted. These imperial grouse are the best-flavoured game-birds met with in India when properly hung, and they are much shot by Rajputs and other sportsmen.

The Indian Houbara bustard (*Houbara Macqueenii*) is met with in great numbers during the cold months in the deserts of Marwar and Jaisalmir, where it feeds principally on the



Quail.



Pochards.

To face page 182.

fruit of the small *ber* tree. It is much prized on account of its size, and of the delicate gamy flavour of its flesh, and the Rajput sportsman spends his leisure hours in pursuit of it when it is in here. The feathers of this species, although bright on both neck and back, are of little use for fly-fishing.

The grey quail (*Coturnix communis*) is sometimes found in enormous numbers throughout the deserts of Marwar and Jaisalmir, and is fairly abundant every cold weather in parts of Sirohi and Godwar. It is generally fat and fit for the table in these States, and it always gives excellent sport. The rain quail (*Coturnix coromandelica*) makes its appearance in greater or less numbers in the grass lands of Marwar and Sirohi every rains, and sometimes stays throughout the cold weather. It is also found in Jaisalmir, but never in great numbers. This species is less shot and netted than the grey quail. However, it receives some attention both from the sportsman and poacher, and it is generally found in good condition for the table.

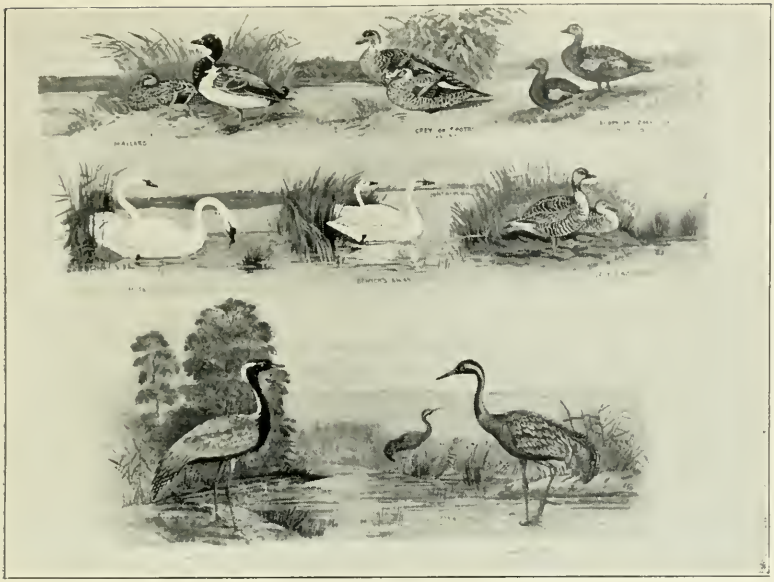
Both florican, viz., *Sypheotides aurita* and *Sypheotides bengalensis*, are seen in the grass lands of these States during the monsoon season; but they disappear before the cold weather has set in. The smaller bird is the more common, and it migrates from here to the Deccan at the end of the rains. Florican feed on the Cantharides beetle (*Cantharis vesicatoria*), therefore the breast only should be eaten, as the other parts sometimes produce great irritation of the urinary system.

Two varieties of crane are met with as winter visitants, viz., the demoiselle (*Anthropoides virgo*) and common crane (*Grus communis*). The former abounds in many parts of these States, where food is plentiful, from September till March, and the latter is not uncommon. Both varieties are easily approached, and may be shot in numbers with a little trouble. They are fine large birds, fairly tender, and sometimes of good flavour when properly hung. The demoiselle crane is superior to the common variety.

Two varieties of starling are winter visitants in these States, viz., *Sturnus vulgaris* and *Sturnus indicus*. Both varieties are well flavoured, but they do not attract the sportsman when other game is plentiful.

There are several varieties of plover which spend the winter here in normal years; the ox-eyed and the courier (*Cursorius coromandelicus*) being the most frequently seen. These birds are not worth shooting when anything else can be got. They are much inferior to both the golden and grey plovers of America and Europe, which are sometimes winter visitants here.

The Sarus crane (*Grus antigone*) is sometimes given with game-birds, but it is much protected by the people here, and should not be shot. It is a permanent resident, and although destructive to crops, the people do not grudge what it eats, as it is considered a bird of good omen.



Ducks and Cranes.

Fish from Banas, Abu Road. *To face page* 184.

FISHES

In this dry country, remote from the sea, where the rivers cease to flow with the cessation of the monsoon, and where few of the tanks can withstand evaporation in an ordinary season, and most of which are almost empty for nine months of the year, the fishes, which constitute part of the fauna, add so little to the food of the people that they might almost be left out of an account of this sort. However, at Bilara, on the Luni river, in Marwar, and along the Banas river, in Sirohi, fish can be caught in considerable numbers, and there are some tanks in these States where fishermen occasionally add to their daily meals by means of their line or net. Moreover, from a scientific point of view, it is necessary to mention the varieties met with. The principal fishes of these States are as follows:—

Lanchi (*Bagarius yarrellii*), a species of *Siluridæ*, known to fishermen as the "fresh-water shark," is common in some of the tanks and rivers of these States. It is a scaleless, amphibious fish, of a silvery grey hue, having, in addition to its gills, a large air-breathing apparatus (the "air" or "swim" bladder being greatly developed), which enables it to live out of water; mouth wide, with many teeth, long nasal, and shorter maxillary barbs, which enable it to feel its way about in the mud; body short, tail long. It is very voracious, destroying other fish, and it will take any bait or spoon; but it does not give good sport, as it will not fight after it has had the first run of the line. It grows to many feet in length. The people appreciate it as food, and an oil is made from it, which is used medicinally.

Sawal or murl (*Ophiocephalus marulius*) is found in tanks and rivers, especially in stagnant pools of rivers, as it likes the mud, and works under banks; head elongated, with sixteen rows of scales between snout and dorsal fin; back greenish brown, with cloudy bands; dorsal, anal, and caudal fins spotted. The murl runs to a large size, even in small waters; it is voracious, and will take spoon or almost any bait; it plays well, and is good for the table. There are at least two varieties of this species, which can live long in the mud of rivers that dry up in the hot weather.

Singhi (*Pseudeutropius sykesii* of *Siluridæ*), a smaller species of scaleless fish than *Lanchi*, is met with in tanks and river pools of these States. It has only one long pair of barbs, the nasal pair being rudimentary; it grows to about six or eight inches in length, and has two bands of teeth; caudal fin-forked, lower lobe slightly the longer. This variety takes almost any kind of bait, is easily landed, and the people consider it good food, although it is bony.

Giri (*Barilius modestus*) is a dark brown backed fish, with scales, found in both tanks and streams. It grows to about eight or ten inches in length, takes bait readily, and gives good sport, but is full of small bones, and not of much use for the table; the people, however, appreciate it.

Mahseer (*Barbus tor*), the head of the carp family (*Cyprinidæ*) is met with in the Western Banás, near Abu Road; but it does not run to a large size there. Mr. ffolliott-Powell, an authority on fishing, informs me that he has not seen them of any great weight from this river. The fishermen at Bilara describe a fish, occasionally met with, which must be a mahseer, and it is very probable they are in the Jaswantsagar Lake and other parts of the Luni river. This handsome "salmon of India" is too well known to require further description here.

Derai (*Barilius barila*) and other small species of *Cyprinidæ*

are met with in the Banas river, in the Luni river at Bilara, and other waters of these States. Some of these little carp run to half a pound or more, and as they take fly and bait well, they give good sport; but they are full of small bones, and of little use for the table in consequence.

Eels are not often seen, but one or two varieties of *Muræniдæ* are known to fishermen in these States.

Rohu (*Labeo rohita*) and other varieties of this species, which belong to *Cyprinidæ*, are found at Bilara, and in other tanks, rivers, and pools of these States. It is a very compact, thickly built, and handsome fish, running up to many pounds in weight; mouth small, lips thick with a small fold, teeth pharyngeal; dorsal fin about midway between snout and caudal fin, latter forked; colour, brown along the back, becoming silvery on sides, gills reddish, scales large. Mr. C. la Touche, who has often seen rohu of 25 lbs. caught, informs me that this fish is difficult to hook, and that it will suck at the bait for ten or fifteen minutes, requiring much practice to know when to strike for it, which must be done with great smartness and vigour. The usual bait for this fish is dough or worms. It plays well, giving excellent sport, and is generally well flavoured and good for the table.

Chilwa (*Aspidoparia morar*) and many other varieties of *Cyprinidæ* are met with in the rivers and streams of these States; they are readily recognised by their silvery scales and flat sides; they give good sport, and are good for the table; they vary in size from an inch and a half to six or seven inches in length.

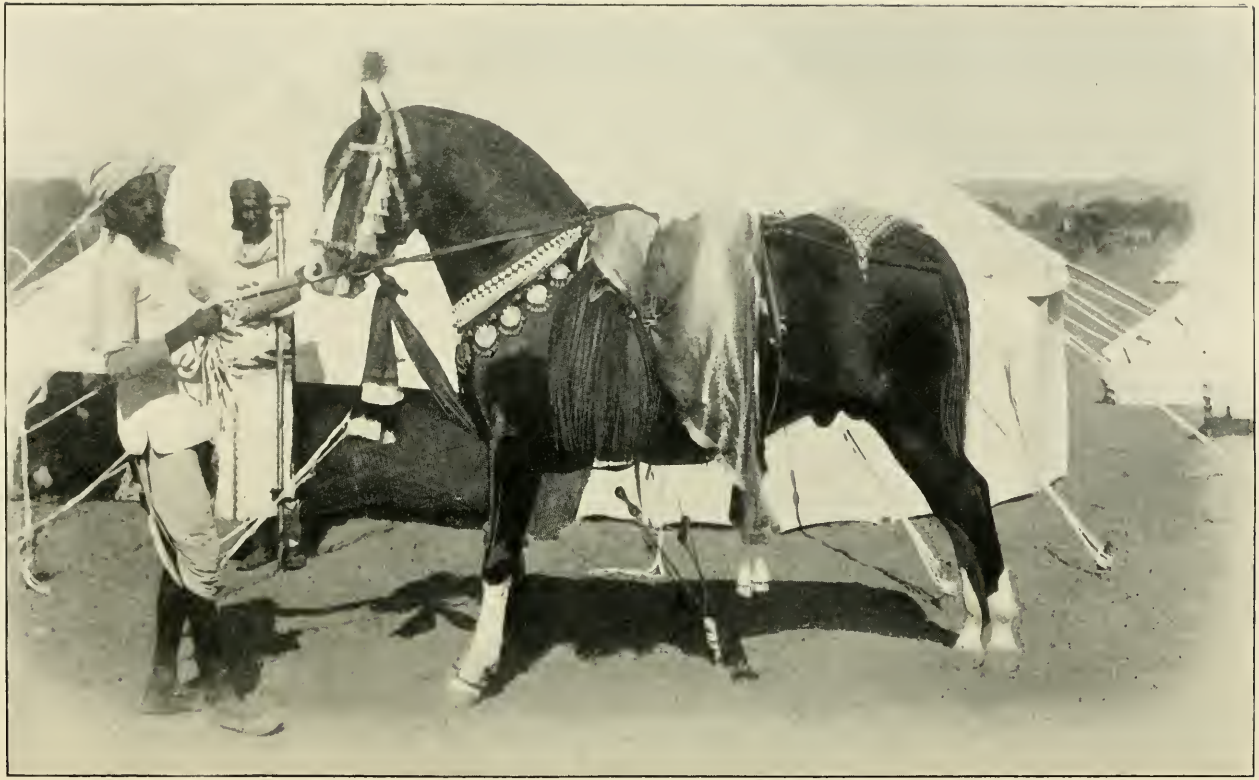
Nátará (*Mugil corsula*), a species of grey mullet, sometimes seen in the waters of these States, can be easily recognised by their swimming in batches, with their eyes just above the water, which makes them look like tadpoles. They are dull brown above, lightish silvery green below, with dorsal and caudal fins grey. I have not seen them more than eight or

ten inches in length here, but have got them larger in the Chambal river at Kotah. They do not take bait, but, being very good for the table, they are worth shooting, which can be easily done on account of their swimming so close to the surface of the water.

The Indian trout (*Barilius bola*) has not, so far as I can ascertain, been found in the Western Banás within the limits of Rajputana, although it is common in the Eastern Banás, near Deoli; nor is there any species resembling it met with in the Luni or any of the other rivers or streams of the Western Rajputana States.

There are three well-known fishes in the Abu Lake, viz., pathal, giri, and singhi, but they are all bony and useless for the table; some of the people, however, appreciate them. They take bait readily at certain times, especially during the monsoon season, when they are more easily caught. Giri and singhi have been before referred to. Pathra (*Notopterus kapirat*), a species of *Clupeidæ*, is a somewhat oval-shaped fish, with the ventral fin extending almost from the throat to the caudal fin, with which it is continuous. It has a small mouth, and takes worm or fly, but does not give much sport, and it is so full of small bones that it has to be pounded in a mortar before it can be eaten.

There are several species of *Crustacea* found in these States, the most important of which are crabs; of these there are three varieties, one found on dry land, the others about streams and tanks. Crabs are abundant in the streams and tanks on Mount Abu, where they are eaten by some people, and said to be well flavoured.



Marwari Horse.

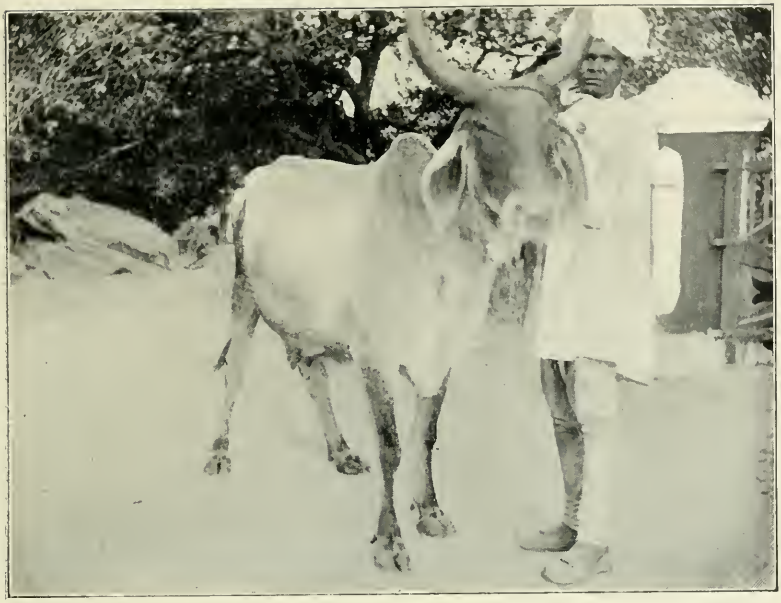
To face page 189.

DOMESTIC ANIMALS OF THE WESTERN RAJPUTANA STATES

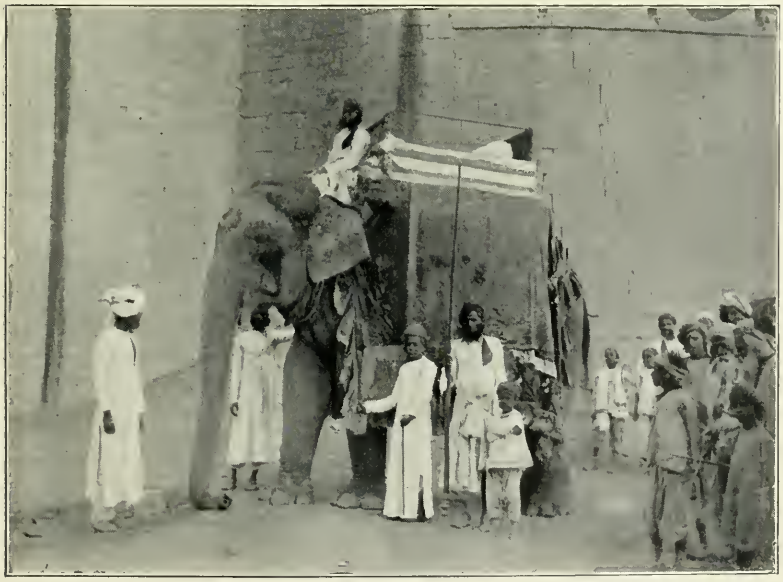
Of domestic animals, the horse (*Equus caballus*, var. *Marwarii*) stands first with Rajputs, and the man who cannot ride a horse in these States is looked upon as an inferior person. Horses are extensively bred in Marwar, and the breed is celebrated for hardiness, beauty, and ease of pace. Marwari horses grow to a good height, and although they are light boned, they will carry heavy weights. Like the camel of the desert, they can cover long distances without food or water. The Rathore is so attached to the equine species that he will often stint himself to feed his horse, which is housed under the same roof, and which, like the Arab's steed, is considered a member of the family from his birth. A smaller horse than the Marwari is bred in Jaisalmir; this animal is also handsome and hardy, but horses are not in such general use in that State, where camels are found more serviceable. In Sirohi the Marwari horse is in high favour and general use. Waler horses are imported into these States, principally for driving, but they are also ridden at the capitals, and played at polo in Jodhpore. Arab horses are used as chargers, troopers, polo ponies, and pig-stickers, and they are sometimes driven. They stand the climate better than the colonial breeds, and the hard grass of the country agrees with them. There are generally a few English horses and ponies in Jodhpore racing and polo stables, and mixed breeds are to be found in the studs; but the latter are mostly inferior to pure country bred, and they are much less hardy.

The wild ass (*Equus onager*) has sometimes wandered up into the western deserts of Marwar and Jaisalmir, but it is now rarely if ever seen in these regions. The domesticated descendant of this species, the small Indian ass, is in general use as a beast of burden, and although sometimes fairly cared for by the Odes and Kumars, it is generally overworked and underfed. The milk of the ass is used medicinally by some of the Baids; it is said to be efficacious in the treatment of plague, and was much used in the epidemic of 1836–37. Mules are used to some extent as baggagers with the cavalry, and are considered superior to ponies for this work.

Cattle (*Bovinus indicus domest.*) are extensively bred throughout the western and north-western deserts of Marwar and Jaisalmir, where many of the people depend mainly on their herds for subsistence. In the hilly tracts of Sirohi also, cattle-breeding on a large scale is carried on, and nearly every villager of any substance in these States has a cow or two. Although tuberculosis is not so likely to be communicated to man by the milk of the Indian desert cow, which lives in the open air, as by the city animal of cold countries subjected to an artificial existence, it is, however, a prudent precaution to boil all milk before it is brought to the table, as this is the easiest way of sterilising it, and making it absolutely free from viable germs. When done on a clear fire in a well-covered vessel, the flavour of the milk is but little changed. Many of the village cows, buffaloes, and even some of the town-bred goats, are not altogether clean feeders, and milk may in this way become the medium for transmitting disease from them to milk consumers. Moreover, contaminations added after the milk has been drawn can be rendered innocuous by being brought to the boiling-point. There is always a danger of impurities of different sorts finding their way into milk in India, even when much care is bestowed upon the dairy. "Dahi," or curd, an article of diet much in use among the



Sanshong Milch Cow.



Elephant saddled for an ordinary occasion. *To face page* 190.

people of the country, is at times dangerous, as the cholera microbe flourishes in this preparation, and it could easily become contaminated by flies, water, and other contacts. A little common salt should always be added to milk before it is drunk, as this prevents its being formed into a hard indigestible ball by the gastric juice, and rendered difficult of assimilation. The cattle of Sanchore, Jalore, Mallani, and Nagore are far famed for their size and beauty. The large herds are never housed, but are allowed to roam over the extensive uncultivated tracts, where they obtain their own food in normal seasons, and in years of famine they are driven away to the Aravallis, Malwa, or Gujerat in search of pasture. Much *ghee* is made from the milk of these great desert herds, and exported both by road and rail. The young bullocks come to the markets in great droves, and are sold for agricultural purposes as well as for driving in country carriages. Some of the bulls are very large; they have massive horns and humps, and still retain much of the magnificent appearance of their wild progenitor. *Bos gaur.*—Buffaloes are more domesticated than the large herds of cattle. They generally graze about the village tanks, and are housed or kept in enclosures at night. The male buffalo has lost much of the grandeur of his ancestor. *Bubalus arni domest.*—Domestic buffaloes are kept principally for milk and butter, but some of them are used for carriage and draught. Neither cow nor buffalo flesh is eaten in these States, except by a few of the low caste people, who feed on those which die naturally. The offence of cow-killing is very severely punished, and some Hindus consider it quite as bad as homicide. Maharaj Sir Pratap Singh has frequently explained to me that the cow has become sacred to the Hindu only by virtue of its usefulness. The cow provides milk and butter; the bullock ploughs the ground, treads out the corn, draws the water, and is yoked equally to the pleasure carriage and dray cart. Without the bullock the Indian cultivator

could hardly exist, and he has advantages over the camel in being hardier in the rainy season, and more easily adapted to agriculture.

Goats and sheep (*Capris* and *Ovis indicus domest.*) are bred on a large scale throughout these States; the former supply the great bulk of the animal food of the country, and goats' milk is in general use as an article of diet, especially in the desert. Sheep are kept principally for their wool, so far as internal use goes, but they are largely exported from Marwar and Jaisalmir, and, although a small breed, they fatten well, and their mutton is second to none in Europe or Asia when they are well fed.

The Indian camel (*Camelus dromedarius*) is among the most useful of the domestic animals of these States, and without it the inhabitants of the northern and western deserts of Jaisalmir and Marwar would have to undergo much hardship and often absolute privation. The camel of the desert ploughs and harrows the ground, brings home the harvests, and is used as a carrier of wood and water. It is ridden both for pleasure and to accomplish long journeys, and it is sometimes driven. Camels' milk is used both as an article of diet and as a medicine. When it dies its skin is made into bottles for *ghee* and oil. The Jaisalmir camels are far famed for their easy paces, speed and hardiness, and they can go hundreds of miles without food or water, subsisting for days on a little unrefined sugar and sulphate of alum, which are carried in their saddle-bags when on long journeys. The best Jaisalmir camels are smaller and finer in the head and neck than the ordinary breeds of this country. The Marwar camels are larger and stronger animals than those of Jaisalmir; they are often very swift, easy paced, and fine-looking, but horses attract so much of the Rathore's attention that less care is bestowed on camel-breeding than in Jaisalmir. Some of the best camels of these States will cover a hundred miles in a night, without difficulty, when

a dacoity has been committed, or when some other emergency demands pace. *Camelus bactrianus*, although sometimes seen here, is not bred in the country.

The elephant (*Elephas indicus*) is kept up for State processions and for shooting expeditions; he is an expensive luxury in these States, where suitable green food is rarely available, and where bread and unrefined sugar have to be provided for his support.

The dog (*Canis familiaris*) is scarcely a domestic animal; he belongs, as a rule, to the town more than to any one of its inhabitants, and is fed, as deserving of charity rather than as a member of the household, after which he is driven into the street like any other beggar. There are numbers of dogs in every village of these States, but they are rarely made use of by the cattlemen or shepherds. They are a source of danger to the public health, as they often suffer from rabies and are generally mangy and diseased. Europe dogs, of every breed, are imported from time to time, and kept at the palaces. They do not stand the climate well, as they contract malarial fever by sleeping on the sand. They also suffer from liver disease, and distemper is common among them. Greyhounds are in use for hunting antelope and jackals, but they soon get foot-sore on account of the thorns and barbed grass of the sandy plains.

The cat (*Felis domest.*) has hardly been domesticated, as it is rarely made a pet of. Cats wander about the roofs of the houses and subsist on rats, mice, and scraps such as they can steal; they are tolerated in some houses to keep down vermin.

Swine (*Sus scrofa indicus domest.*) are only occasionally kept by the low-caste people who reside outside the villages of these States. They are degenerate animals and very dirty feeders. Their flesh is often impregnated with tapeworm cysts and trichinæ, which make it dangerous as an article of diet, even when cooked.

The black-faced lungúr (*Presbytis illiger*) has become almost domestic. He goes about roofs of houses and gardens, is protected and fed by the people, allowed to help himself to grain, fruit, and vegetables, and to do much mischief in gardens. These lungúrs are very numerous in many parts of the Western Rajputana States, and there is a legend that they took up arms and rendered great service to Rama, Raja of Ajodhya, in the war that ensued between him and Ráwan, Raja of Lunka, or Ceylon, when the latter carried off Sita, the wife of the former, to Ceylon. The red-faced monkey (*Inuus rhesus*) is not common in this part of the country. These monkeys also behaved staunchly to their leader Hanumán, and followed him when the latter supported Rama against Ráwan, rendering much assistance in the capture of Ceylon and the restoration of Sita to her husband.

Poultry are not extensively bred in this part of the country, although a few fowls, ducks, and sometimes geese may be seen about the large towns, and the guinea fowl (*Numida meleagris*) thrives well. The Rajput does not relish eggs or fowls, although he appreciates feathered game as an article of diet.

The peacock (*Pavo cristatus*) and the blue rock pigeon (*Columba intermedia*) are held sacred by the Hindus here, on account of their beauty. They are tamer than some of the ordinary domestic animals. Peacocks and pigeons are fed and protected, consequently they are found in great numbers everywhere throughout the country where there are trees or other suitable shade. Peacocks are considered birds of good omen, and their tail feathers are much prized by Sadhus and temple keepers. The long tail feathers of the peacock are collected and laid up in bundles in houses, to protect the inmates and domestic animals against the evil eye. They are applied to sprained and otherwise injured limbs, both of men and animals, to effect cures, and there is none of the Western superstition of ill-luck attached to them in this country. The chief noble

of Marwar has the privilege of a seat in the back of the Maharaja's "howda," on occasions of great State processions, where he waves the peacock "chhaori" over the head of His Highness to keep off flies. This "chhaori" consists of a bundle of long feathers of the peacock's tail, set in a gold embroidered handle, and the office attached to its use is of great dignity in the State.

The game-cock (*Gallus bat.*) is bred for fighting, and bets are freely made on their pugilistic encounters.

The grey partridge (*Ortygornis pondiceriana*) and the grey quail (*Coturnix communis*) are also domesticated for fighting, and both money and temper frequently lost on their combats.

PRESERVATION OF HEALTH

In a climate like that of these States, where the annual ranges of temperature approach extremes, and where the diurnal and nocturnal maximum and minimum vary between summer heat and freezing-point, it is obvious that many precautions are necessary for the preservation of health, especially of Europeans resident in the country. The ordinary inhabitants resort to opium, when exposed, to lessen the sting of extreme cold. They also shut out the air from their dwellings during cold nights, and cover up their heads with their clothes or blankets, so that the breathing of fresh air is impossible; consequently they come under the soporific effects of carbonic acid in the blood, and this dulls their sensations and keeps them from feeling the cold as they otherwise would.

Throughout the hot weather the body and head should be kept as cool as possible, and light clothing worn, which should be loose at the neck to prevent pressure on the great vessels which supply and return the blood from the brain. At other seasons, when the temperature falls rapidly after sunset, warmer clothes should be put on to prevent sudden suppression of perspiration or chill; after exercise, too, the body temperature should be kept up by additional clothes, and a warm bath taken as soon as possible. Rapid suppression of perspiration, even in the hot weather, drives the blood from the surface, produces congestion of the internal organs, and perverts secretions by suddenly throwing work on internal glands which should be carried on by the cutaneous surface. It is sometimes necessary, in the hot weather, to reduce the very high tempera-

ture of the hot wind by passing it through damp "tattis." It is then well to guard against chills, fever, and even rheumatism, which are frequently induced by the damp air of "tattis." The cooling apparatus should be removed every evening to allow of the proper ventilation of the room, which should not be used as a sleeping-apartment when this can be avoided. Sleeping out of doors during the hot dry months is healthy, but the body should be covered to prevent too rapid evaporation, chill, and a sensation of fatigue which is sometimes experienced after sleeping in the wind.

When the rains set in sleeping out of doors should be discontinued and an airy room occupied upstairs if possible, as being much out of doors after sunset during the damp season, when malaria is active, is often followed by attacks of fever, bowel complaints, and even liver affections. Elevation above the ground is a safeguard against malaria, and all Indian houses should have upper stories for sleeping in. Light flannel clothing is the best at this season, as flannel absorbs the moisture of the air, protects the surface of the body, and prevents suppression of perspiration.

When the cold weather sets in great precautions against chill are necessary, as the skin is then still relaxed after the intense summer heat and damp of the rains; it therefore requires protection against the sudden change of temperature which takes place at sunset. Warm under-clothes should at this time be worn, even when they give rise to a little discomfort at certain hot times of the day. When the feet and legs have been wet by wading in marshes after game, or when clothes have become drenched by rain, a hot bath should be taken, and a change into warm things made as soon as possible. A dose of quinine on such occasions is a wise precaution against fever, liver and bowel complaints, which are liable to follow such exposure in warm countries.

Residents in the hills should guard against chills at all

seasons, by always wearing warmer clothes than they are accustomed to in the plains below. Failure to do this is often the excitant of bowel, liver, and other complaints common at high altitudes.

The protection of the head and spine from the sun's rays is of great importance, and the temperate, who attend to these points, can undergo much exposure during the hottest weather without loss of health or energy. The sun-hat should be light, and wide enough to protect the ears, eyes, and back of the neck; the spine should be protected by a pad attached to the outside of the hot weather jacket, as this shifts with motion and allows of ventilation and evaporation. The service helmet is not sufficient protection for the hot weather, and it could be much improved without detriment to smartness. Glasses are sometimes necessary, when exposed to glare; they should be of neutral tint, and should never be removed until they can be taken off indoors. Retinitis and other eye affections are not infrequent from taking off glasses in the glare, as this allows of a great rush of light through the dilated pupil, which is injurious to the internal structures of the eye.

Few can stand cold water bathing after long residence in hot countries, and fever is not an uncommon sequence of a cold bath under such circumstances. It is therefore advisable to bathe in warm water, and a light shower-bath or douche of cold water afterwards is grateful and bracing; but it should not be prolonged, and the skin should be well dried after this to restore the blood to the surface. Many people in this country can indulge in a swimming bath, who could not stand an ordinary cold tub; the exercise of swimming being sufficient to prevent any lowering of the system or chilling of the body.

There are often difficulties in obtaining proper food supplies in this part of the country, where there are few tanks or

rivers to supply fish, and where vegetables are not often plentiful on account of the dryness of the soil. Beef is prohibited by treaty, so there is often want of variety on this account. Excellent mutton and good poultry can be had, if a little trouble be taken in feeding. Imported fruit is not difficult to obtain to supplement the local products, which are neither very abundant nor very good.

The meat of hot countries is less nutritious, and more difficult to digest than that of the West. Consequently there is often a craving for more food than is necessary, and new arrivals frequently suffer from over-eating in trying to satisfy this sensation. Food should be plain and well cooked. Meat should be fresh and thoroughly done to the centre of the joint to prevent risk from impurities, such as poisonous ptomains and ova of parasites not uncommon in hot countries. Tinned provisions should be carefully examined and removed from the tins as soon as they have been opened. It is a wise precaution to recook tinned foods, and they should not be eaten if they be discoloured, or if they show any signs of decomposition. Dangerous symptoms and even fatal consequences have frequently followed the consumption of bad tinned fish, meat, and even fruit. Sardines rapidly spoil when they have been opened, or when they have not been properly covered with oil in the tin, and tinned shell-fish are often bad. Meals should be regular, frequent, and light, as overloading of the stomach tends to produce liver affections and indigestion. During the hot weather the meals should be farinaceous, as less meat is then required than when it is cold and bracing, and when much exercise is usually being taken. Fruit should be eaten in the morning in preference to the evening, and fresh vegetables should form part of the principal meals. Very hot curries should be avoided, also over-spiced dishes. Well-made curries are, however, both palatable and easily digested; but they should not be too freely indulged in, as

they weaken the powers of digestion when in too common use.

Wines should be taken guardedly, as they undoubtedly tend to produce liver affections and degeneration of tissues, when consumed freely in warm climates; those that can be well diluted with soda-water or drinking water are least harmful and most easily assimilated. Beer and heavy wines can only be digested when exercise is being taken, and weak whisky, diluted with soda-water, or claret mixed with water, are the best drinks for those who require stimulants in this country. All drinking water should be boiled and filtered through a candle filter, which restores the air driven off by heat, and makes it pleasant to the taste. Even when filtering cannot be carried out, boiling should never be neglected, as it rids water of much of its inorganic impurities, and renders the germs of disease innoculous. Tea and coffee are wholesome drinks, but they should be carefully made and never too strong.

A moderate indulgence in tobacco is practically harmless, even in tropical countries, and it is so agreeable and soothing to many people that it should not be interdicted. The excessive use of the plant slows the heart's action, gives rise to dyspepsia, and general poisoning of the system, which is often accompanied by impaired vision, sleeplessness, and a burning sensation in the mouth and throat. These grave symptoms only disappear when smoking is wholly abandoned, or greatly diminished.

In this country regular exercise is essential to health, but it should not be carried to exhaustion, especially in those who are not robust, as fatigue under relaxing conditions of climate leads to lowered vitality and predisposes to disease, malarial and other evil influences being ever ready to take advantage of weakened powers of resistance. Horse exercise is the best form, and polo is the best of games to maintain health and

vigour. However, all open-air games and field-sports are health-giving, as they combine excitement with fresh air and exercise, and these are the essentials for a good digestion, sound sleep, and health in hot countries, where there is a tendency to inactivity and lethargy, and where the liver requires frequent shaking up to enable it to perform its functions satisfactorily.

In warm countries, where sound sleep is not always possible at night on account of the heat, a short siesta is health-giving, and often necessary, especially for early risers. Ample sleep stays wear and tear of the system and is conducive to good health and longevity, but it should never be indulged in immediately after a full meal (to which there is a tendency in tropical climates), as this is a frequent cause of indigestion and liver affections.

Over work has to be guarded against, especially office work, which is yearly on the increase. As this necessitates sedentary habits within doors, it is likely to be detrimental to health if it be allowed to interfere with necessary exercise in the fresh air.

Change of scene and air has always a good effect on the constitution, and it is often very marked in this country, especially in low fevers which occasionally resist all other treatment. Even a change from one room to another has sometimes a wonderful effect on a sick person, and a change to another house or locality frequently acts in a striking manner. When the health begins to suffer from long residence a change to Europe should be taken at once: unfortunate results from postponement in departure when change is necessary to recovery, are too often seen. For Europeans long resident in the Tropics a sea voyage is the best change, as it works out of their systems the poison of malaria, which is at the bottom of most bodily ailments in this country.

BIRTH-RATE

JODHPORE.—Registration of births and deaths was commenced on the 1st January 1894 for the city of Jodhpore, and it is still difficult to get the requisite information from the people; they are so reticent regarding their domestic occurrences, especially in the case of female births. Indeed, it is difficult to make the residents of this capital of the desert understand that anything more than idle curiosity actuates the official whose duty it is to record such occurrences; and that the father and head of a house should have to report a family misfortune, such as the birth of a daughter, which brings the derision of his own household upon him and excites the jests of passers by, is still beyond the comprehension of these people. Under such circumstances, time and education must be relied upon to overcome the opposition which now besets the registration of vital statistics.

Rural registration is still under consideration, and, it is hoped, a move in this direction will shortly be made.

The following system of registration is observed:—The Registrar receives reports of births and deaths from the gate-keepers of the city, and also from the city *Dais*, and submits them daily to the Residency Surgeon's office, where monthly and annual returns are compiled.

It will be observed from the accompanying table that the births in the last half of the year far exceed those in the first, and this corresponds with observations made in other places. The Jodhpore Table for January, however, is somewhat of an exception, as the births registered in that month

Birth Returns for Jodhpore City from 1894 to 1897.

Months.	1894.		1895.		1896.		1897.		Total.		Average.		Conception.		Birth.	
	a.	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*
January . . .	7	102	2	102	4	84	4	87	17	375	6	93·75	1	December	1	September
February . . .	12	49	4	99	9	53	6	86	31	287	7	71·85	2	February	2	November
March	11	56	9	56	7	62	10	54	37	228	10	57·00	3	January	3	October
April	6	107	11	49	11	42	12	46	40	244	11	61·00	4	November	4	August
May	8	83	10	52	12	36	11	49	41	220	12	55·00	5	March	4	December
June	9	73	12	48	10	43	9	71	40	235	9	58·75	6	April	6	January
July	9	73	8	73	8	57	7	80	32	283	8	70·75	7	May	7	February
August	5	112	3	100	6	71	1	129	15	412	4	103·00	8	October	8	July
September . .	1	162	1	114	5	78	2	122	9	476	1	119·00	9	July	9	April
October . . .	2	156	7	79	3	100	3	97	15	432	3	108·00	10	September	10	June
November . . .	3	155	6	93	1	116	4	87	14	451	2	112·75	11	June	11	March
December . . .	4	125	5	95	2	112	7	80	18	412	4	103·00	12	August	12	May
Total . .	...	1253	...	960	...	854	...	988	...	4055	...	...	...	.....	...	.....

a. Order of months.

b. Order of births.

have generally been high, and the same circumstance has been observed in Bikanir. A study of the last column of the table shows that conception is most frequent during the cold months, and least during May, June, July, August, September, and October, which may be considered the season of greatest heat and also of after malarial influences.

Sirohi.—Nearly the same system of registration of births and deaths is followed in Sirohi as in the other Western Rajputana States; it was commenced in 1894, both for the capital and for rural circles, and although regular returns are furnished, they are not yet accurate. However, in course of time better results are expected. In the following table of birth returns for Sirohi city there is one feature more or less constant for the whole period under consideration, viz., that the births in the last six months of the year generally exceed those in the first six months, excepting January, which stands high as regards birth-rate, and this clearly points out that conception more frequently takes place during the cold months.

Jaisalmir.—Nearly the same system for recording births and deaths is followed in Jaisalmir city and State as that in Jodhpore and Sirohi.

As in the tables of Jodhpore and Sirohi, so in the Jaisalmir returns (p. 206), it will be observed that the births in the last half of the year generally exceed those in the first, with this difference only, that the month of June is an exception and stands high as regards birth-rate.

The same table also tends to prove that conception takes place more frequently during the cold months than during other seasons of the year.

Birth Returns for Sirohi City from 1894 to 1897.

Months.	1894.		1895.		1896.		1897.		Total.		Average.		Conception.		Birth.	
	a.	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*
January . . .	...	...	1	17	8	4	8	4	17	25	3	8.33	1	February	1	November
February . . .	...	...	3	9	11	2	6	6	20	17	8	5.67	2	November	2	August
March	...	...	10	5	7	5	10	2	27	12	9	4.00	3	April	3	January
April	...	...	9	5	9	3	12	1	30	9	10	3.00	4	January	4	October
May	...	...	12	2	12	1	9	3	33	6	12	2.00	5	March	5	December
June	7	5	11	3	3	8	3	7	17	18	7	6.00	6	October	6	July
July	6	5	8	5	5	7	5	6	18	18	6	6.00	7	September	7	June
August	5	6	5	6	6	5	1	14	12	25	2	8.33	8	May	8	February
September . .	3	11	7	5	10	2	11	1	28	8	11	2.67	9	June	9	March
October . . .	4	9	4	7	2	12	7	5	13	24	4	8.00	10	July	10	April
November . . .	2	11	6	5	1	13	2	8	9	26	1	8.67	11	December	11	September
December . . .	1	17	2	10	4	7	4	6	10	23	5	7.67	12	August	12	May
Total . .	...	64	...	79	...	69	...	63	...	211	...	...	...	.....	...	.....

a. Order of months. *b.* Order of births.

Birth Returns for Jaisalmir City from 1894 to 1897.

Months.	1894.		1895.		1896.		1897.		Total.		Average.		Conception.		Birth.	
	a.	*b.*	*a.*	*b.*	*a*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*	*a.*	*b.*
January . . .	1	36	9	29	9	22	5	28	24	115	6	28.75	1	February	1	November
February . . .	5	32	11	25	7	28	9	25	32	110	9	27.50	2	November	2	August
March	2	34	5	34	8	26	12	19	27	113	8	28.25	3	September	3	June
April	11	23	7	30	11	16	6	27	35	96	11	24.00	4	October	4	July
May	6	28	4	35	11	16	11	22	32	101	10	25.25	5	January	5	October
June	6	28	7	30	2	39	4	31	19	128	3	32.00	6	March	6	December
July	6	28	2	36	3	34	7	26	18	124	4	31.00	7	April	6	January
August	9	27	2	36	5	31	1	47	17	141	2	35.25	8	June	8	March
September . .	12	17	12	23	5	31	9	25	38	96	12	24.00	9	May	9	February
October . . .	10	25	10	27	4	33	3	32	27	117	5	29.25	10	August	10	May
November . . .	2	34	1	45	1	42	2	33	6	154	1	38.50	11	July	11	April
December . . .	4	33	5	34	9	22	7	26	25	115	6	28.75	12	December	12	September
Total . .	...	345	...	384	...	340	...	341	...	1410	...	...	...	.....	...	.....

a. Order of months.

b. Order of births.

DISEASES

THE following tables of reference are given:—Mortality tables of Jodhpore, Sirohi, and Jaisalmir cities, from 1894 to 1897. Statements showing strength, admissions, deaths, &c., in jails. Returns of patients treated in the hospitals and dispensaries.

Mortality Table, Jodhpore City, from 1894 *to* 1897.

Years.	Cholera.	Small-pox.	Fever.	Bowel Com-plaints.	Snake-bites.	Injuries.	All others.	Total.
1894 . . .	...	1	1590	73	1	20	300	1985
1895 . . .	...	...	1106	23	...	19	208	1356
1896 . . .	...	88	852	28	...	17	191	1176
1897 . .	...	12	778	13	...	25	103	931
Total . .	...	101	4326	137	1	81	802	5448

Mortality Table, Sirohi City, from 1894 *to* 1897.

Years.	Cholera.	Small-pox.	Fever.	Bowel Com-plaints.	Snake-bites.	Injuries.	All others.	Total.
1894 . . .	...	...	82	2	...	...	6	90
1895 . . .	...	...	107	1	...	...	5	113
1896 . . .	...	3	78	17	...	1	12	111
1897 . . .	...	18	52	5	...	1	27	103
Total . .	...	21	319	25	...	2	50	417

Mortality Table, Jaisalmir City, from 1894 *to* 1897.

Years.	Cholera.	Small-pox.	Fever.	Bowel Com-plaints.	Snake-bites.	Injuries.	All others.	Total.
1894 . . .	...	6	153	51	...	15	117	342
1895 . . .	...	...	180	56	...	16	101	353
1896 . . .	...	46	161	67	1	13	103	391
1897 . . .	...	...	82	23	...	23	78	206
Total . .	...	52	576	197	1	67	399	1292

Mortality from all Diseases in Jodhpore City, for each Month, from 1894 *to* 1897.

Months.	Deaths.						
	1894.	1895.	1896.	1897.	Total of Four Years.	Mean.	Percent-age to Total Mortality.
January . .	132	131	133	65	461	115.25	8.46
February . .	151	72	108	72	403	100.75	7.40
March . . .	153	104	103	64	424	106.00	7.78
April . . .	175	107	75	67	424	106.00	7.78
May . . .	153	80	97	72	402	100.50	7.38
June . . .	95	61	83	75	314	78.50	5.76
July . . .	111	46	73	40	270	67.50	4.96
August . .	235	94	98	65	492	123.00	9.03
September .	235	195	137	118	685	171.25	12.57
October . .	245	107	116	123	591	147.75	10.85
November .	185	184	85	108	562	140.50	10.32
December. .	115	175	68	62	420	105.00	7.71
Total . .	1985	1356	1176	931	5448	1362.00	100.00

I.—RETURN OF PATIENTS TREATED AT THE HEWSON HOSPITAL, JODHPORE, *from* 1890 *to* 1897

1.	2.	3.																																					4.
		General Diseases.																Local Diseases.																						
No.	Months	Smallpox.	Cholera.	Dysentery.	Malarial Fevers.	Primary Syphilis.	Secondary Syphilis.	Gonorrhœa.	Scurvy.	Worms.	Debility and Anæmia.	Rheumatic Affections.	Tubercular Disease.	Leprosy.	All Other General Diseases.	Diseases of the Nervous System.	Diseases of the Eye.	Diseases of the Ear.	Diseases of the Nose.	Diseases of the Circulatory System.	Diseases of the Lungs.	Other Diseases of the Respiratory System.	Diarrhœa.	Dysentery.	Diseases of the Liver.	Other Diseases of the Digestive System.	Diseases of the Spleen.	Other Diseases of the Lymphatic System.	Goitre.	Diseases of the Urinary System.	Boil Clusters.	Other Diseases of the Generative System.	Diseases of the Organs of Locomotion.	Diseases of the Connective Tissue.	Ulcers.	Other Diseases of the Skin.	All Other Local Diseases.	General Injuries.	Local Injuries.	Poisons.	Total.
1.	January . .	1		143	1,622	60	94	114	8	18	201	376	5	19	98	275	294	383	21	7	79	605	70	251	55	605	160	39		104	3	63	42	258	352	1,216		21	261	22	7,946
2.	February . .	2		115	982	56	69	86	15	21	155	418	2	29	104	303	259	431	19	5	77	401	80	216	46	579	100	74		65	2	83	43	207	322	1,329		10	223	16	6,944
3.	March . . .			117	988	64	71	104	20	29	177	467	12	22	162	294	342	404	39	15	115	407	85	282	61	806	127	44	1	89	1	90	54	281	402	1,260		21	297	45	7,795
4.	April			147	778	86	72	111	11	106	181	443	9	19	151	30	343	405	40	17	79	333	87	327	57	856	133	56		85		89	38	223	340	1,066	200	18	362	78	7,647
5.	May		30	136	752	69	69	143	15	174	142	529	5	27	163	341	306	463	45	13	63	287	104	368	61	844	127	76		64		123	94	354	324	1,172	57	24	276	90	7,920
6.	June		735	113	691	104	83	108	21	108	142	460	5	16	150	317	248	514	33	8	58	232	93	582	45	715	93	69	1	67		81	77	429	240	1,040	56	15	310	101	7,940
7.	July		590	217	1,060	121	79	84	16	86	158	473	8	14	150	280	345	601	30	15	27	251	164	354	41	707	99	46		58		47	49	470	408	1,221	60	13	360	95	8,797
8.	August . . .		6	327	3,182	103	75	89	24	70	171	502	6	16	131	332	560	681	19	8	37	371	351	346	44	838	96	51	1	57		83	41	462	513	1,453	39	16	316	57	11,475
9	September . . .		199	387	6,208	65	70	74	20	62	215	488	2	15	157	326	531	605	27	7	21	355	229	338	38	933	195	58	..	80		72	48	416	503	1,312	40	25	288	66	12,407
10.	October . . .		125	259	7,324	55	63	76	17	38	206	474	2	15	151	328	375	528	50	13	20	592	117	287	49	929	240	50		50	1	53	43	304	374	1,203	39	28	203	58	12,729
11.	November . .		.	259	4,863	45	62	62	20	30	201	407	8	14	106	335	296	399	56	9	40	692	101	278	75	781	265	66		53	4	42	46	278	344	990	40	20	200	24	11,409
12.	December . . .			149	2,831	54	65	79	8	13	194	337	3	9	75	312	290	382	13	6	43	716	87	282	53	641	244	34		69	4	71	53	225	385	1,092	36	24	260	14	9,154
	Total . .	3	1,085	2,269	31,271	882	872	1,130	195	755	2,143	5,374	67	215	1,598	3,746	4,209	5,796	392	123	639	5,242	1,568	3,711	625	9,234	1,872	663	3	841	15	898	628	3,907	4,507	14,354	567	225	3,356	666	116,253
	Percentage	0.00	1.45	1.95	26.90	0.76	0.75	0.97	0.17	0.65	1.84	4.62	0.06	0.18	1.37	3.22	3.62	4.99	0.34	0.11	0.55	4.51	1.35	3.19	0.54	7.94	1.62	0.57	0.00	0.72	0.01	0.77	0.54	3.36	3.88	12.35	0.49	0.19	2.89	0.57	99.99

To face p. 209.

II.—RETURN OF PATIENTS TREATED IN THE CENTRAL JAIL, JODHPORE, *from* 1890 *to* 1897

1.	2.	3. General Diseases.														Local Diseases.																									4.
No.	Deaths.	Smallpox.	Cholera.	Dysentery.	Malarial Fevers.	Primary Syphilis.	Secondary Syphilis.	Gonorrhœa.	Scurvy.	Worms.	Debility and Anæmia.	Rheumatic Affections.	Tubercular Disease.	Leprosy.	All Other General Diseases.	Diseases of the Nervous System.	Diseases of the Eye.	Diseases of the Ear.	Diseases of the Nose.	Diseases of the Circulatory System.	Diseases of the Lungs.	Other Diseases of the Respiratory System.	Diarrhœa.	Dyspepsia.	Diseases of the Liver.	Other Diseases of the Digestive System.	Diseases of the Spleen.	Other Diseases of the Lymphatic System.	Goitre.	Diseases of the Urinary System.	Soft Chancre.	Other Diseases of the Generative System.	Diseases of the Organs of Locomotion.	Diseases of the Connective Tissues.	Ulcers.	Other Diseases of the Skin.	All Other Local Diseases.	General Injuries.	Local Injuries.	Poisons.	Total.
1.	January			43	93	9	6	4		2	27	15			7	5	15	3	1	1	27	72	50	5		26	2			6		1		15	6	16	1	1	16		475
2.	February			34	77	1	7	2	1	...	9	14			8		4	2			26	63	38	6	1	25	1	10		4		1	2	10	3	12			8		369
3.	March			43	75	3	5	2	4	.	11	13			4	6	7	2			35	48	46	12	1	32	1	14		8		3	5	12	7	7			6	1	413
4.	April			39	76	7	5	3	1		17	33		2	15	8	6	2	1		11	34	52	13	1	30	4	11		7		1	3	16	8	14		.	10		430
5.	May	1		28	54	2	5	4	1	4	15	15			23	13	13	4	1		8	20	58	12		39	3	8		6		2	3	20	4	16	1		10	7	400
6.	June		15	37	59	5	6	3	2	5	9	16	2		24	4	14	1			7	24	59	15	1	33	4	3		4		1	2	19	9	23	1		11	2	420
7.	July		13	75	112	6	6	5	6	1	14	19	1		24	7	15	1	1		13	42	114	29	3	32	5	1		9		1	6	10	9	33	1	3	12	1	630
8.	August			134	176	2	1	2	3	2	14	12			25	5	32				7	22	99	41	3	22	2	4		8		2	1	13	7	36	2		10	2	689
9.	September			110	233	2	5	1			19	15	1		16	7	16	1			9	45	127	19		23	1	1		5		1	4	18	15	10			8		712
10.	October			74	175	3	2	1	6	..	17	11		1	15	2	15	1			11	42	91	8	3	20			...	9		1	1	17	2	6	2	2	8		546
11.	November	.		48	108	21	5		4		17	8	6		2	9	15	4	3		22	44	52	9		28	1			5	.	1	1	7	1	12	.	2	8		443
12.	December			46	114	7	3	5		1	20	20			10	5	7	4	1	4	44	27	37	4	2	16	1	1		6	..	1	1	12	6	10	2	.	3		420
	Total	1	28	711	1,352	68	56	32	28	15	189	191	10	3	173	71	159	25	8	5	220	483	823	173	15	326	25	53		77	...	16	29	169	77	195	10	8	110	13	5,947
	Percentage	0.02	0.47	11.96	22.73	1.14	0.94	0.54	0.47	0.25	3.18	3.21	0.17	0.05	2.91	1.19	2.67	0.42	0.13	0.08	3.70	8.12	13.84	2.91	0.25	5.48	0.42	0.89	...	1.29	.	0.27	0.49	2.84	1.29	3.28	0.17	0.13	1.85	0.22	99.97

To face p. 209

III.—RETURN OF PATIENTS TREATED AT PALI, NAGPORE, MERTA, JALORE, BILARA, POHKARAN, JASOLE, DIDWANA TOWN, JODHPORE (FIRST BRANCH AND SECOND BRANCH) DISPENSARIES, *from* 1890 *to* 1897

1.	2.	3.																																		4.
		General Diseases.													Local Diseases.																					
No.	Months	Smallpox.	Cholera.	Dysentery.	Malarial Fevers.	Primary Syphilis.	Secondary Syphilis.	Gonorrhœa.	Scurvy	Worms	Debility and Anæmia	Rheumatic Affection	Tubercular Disease.	Leprosy.	All Other General Diseases.	Diseases of the Nervous System.	Diseases of the Eye.	Diseases of the Ear.	Diseases of the Nose.	Diseases of the Circulatory System.	Diseases of the Lungs.	Other Diseases of the Respiratory System.	Diarrhœa.	Dysentery.	Diseases of the Liver.	Other Diseases of the Digestive System.	Diseases of the Spleen.	Other Diseases of the Lymphatic System.	Goitre.	Diseases of the Urinary System.	Sore Chancre.	Other Diseases of the Generative System.	Diseases of the Organs of Locomotion.	Diseases of the Cutaneous Tissues.	Ulcers.	Other Diseases of the Skin.	All Other Local Diseases.	General Injuries.	Local Injuries.	Filariasis.	Total
1	January	3	...	392	4,128	203	132	340	44	122	363	1,220	33	32	272	862	1,205	1,994	149	54	559	1,711	524	454	114	2,074	329	178	8	176	2	119	434	750	2,383	1,301	77	61	811	96	28,464
2	February	7	...	334	2,739	211	126	274	58	112	263	987	23	12	236	692	1,763	1,544	89	25	413	1,252	435	457	87	1,872	173	167	6	182	1	100	373	540	1,667	4,878	64	87	641	109	23,410
3	March	14	...	414	3,067	261	130	304	55	167	293	1,205	30	24	366	873	2,765	1,760	87	40	424	1,260	548	575	98	2,389	186	185	15	180	2	90	380	785	2,021	5,417	87	89	897	239	27,741
4	April	6	11	439	2,790	268	139	333	54	353	306	1,091	21	24	346	825	2,802	1,798	101	30	328	985	324	636	89	2,503	191	180	9	197	9	97	425	912	1,801	4,781	107	123	705	498	26,968
5	May	2	490	363	2,395	267	170	313	75	341	141	1,258	26	21	362	833	2,125	1,684	100	37	287	844	520	559	100	2,578	228	236	6	205	11	115	479	915	1,857	4,458	94	77	948	539	26,420
6	June	4	1,009	326	1,969	245	162	291	43	408	302	1,181	27	21	340	773	1,713	2,120	89	45	224	703	539	687	96	2,438	189	276	9	191	12	122	506	1,243	1,966	4,264	134	75	921	664	26,347
7	July		386	673	2,422	250	152	289	65	356	292	1,177	28	19	312	813	2,571	2,558	67	24	181	704	802	835	91	2,522	175	281	11	199	11	114	511	1,456	2,343	4,570	111	100	1,105	632	20,010
8	August		186	906	4,229	214	143	279	55	284	269	1,151	22	18	318	858	4,019	2,681	91	34	225	782	1,067	767	122	2,496	199	339	5	204	11	124	432	1,096	2,872	5,310	90	83	925	429	33,820
9	September		275	903	10,372	205	148	255	55	189	261	1,097	14	20	329	803	3,308	2,293	85	40	204	770	903	647	103	2,453	234	252	4	179	2	120	434	858	2,486	4,633	104	87	763	395	36,346
10	October	1	...	613	15,417	193	103	246	39	131	307	1,036	20	21	347	770	2,103	1,765	137	32	279	1,205	749	649	113	2,601	351	196	7	143	7	117	383	959	2,188	4,147	106	79	789	329	38,648
11	November		22	406	11,606	198	113	242	59	115	375	905	10	13	279	805	1,588	1,689	127	33	565	1,444	588	569	112	2,206	401	184	11	159	10	100	342	829	2,078	3,777	79	95	685	188	32,985
12	December			404	6,896	224	121	267	31	88	351	1,091	13	18	253	746	1,693	1,773	107	33	461	1,618	573	504	96	2,062	350	196	8	159	5	114	373	753	2,159	4,304	98	71	678	113	28,766
	Total	37	2,351	6,261	68,320	2,799	1,657	3,433	633	2,656	3,723	13,489	267	243	3,760	9,633	28,375	23,857	1,207	427	3,950	13,184	7,772	7,539	1,221	28,205	3,006	2,671	99	2,174	83	1,341	5,072	11,095	25,863	55,680	1,157	1,061	9,698	4,224	558,525
	Percentage	0.01	0.66	1.75	19.11	0.78	0.46	0.96	0.18	0.74	1.04	3.76	0.07	0.07	1.05	2.69	7.91	6.65	0.34	0.12	1.10	3.71	2.17	2.10	0.34	7.87	0.84	0.74	0.03	0.61	0.02	0.37	1.41	3.09	7.21	15.53	0.32	0.30	2.70	1.18	99.99

To *face* p. 209.

*Mortality from all Diseases in Sirohi City, for each Month, from 1894 to 1897.**

Months.	Deaths.						
	1894.	1895.	1896.	1897.	Total of Four Years.	Mean.	Percentage to Total Mortality.
January . .	...	16	7	5	28	9.33	6.72
February . .	...	14	6	17	37	12.33	8.87
March . . .	...	18	9	6	33	11.00	7.91
April . . .	...	6	2	5	13	4.33	3.12
May . . .	...	6	14	10	30	10.00	7.20
June . . .	5	5	5	8	23	5.75	5.52
July . . .	7	5	11	5	28	7.00	6.71
August . .	9	8	11	7	35	8.75	8.39
September .	9	6	15	14	44	11.00	10.55
October . .	26	13	8	10	57	14.25	13.67
November .	18	6	9	8	41	10.25	9.83
December .	16	10	14	8	48	12.00	11.51
Total . .	90	113	111	103	417	104.25	100.00

* The vital statistics commenced in Sirohi State from 1st June 1894.

Mortality from all Diseases in Jaisalmir City, for each Month, from 1894 to 1897.

Months.	Deaths.						
	1894.	1895.	1896.	1897.	Total of Four Years.	Mean.	Percentage to Total Mortality.
January . .	30	27	82	16	155	38.75	12.00
February . .	41	29	33	18	121	30.25	9.37
March . . .	71	40	45	19	175	43.75	13.54
April . . .	41	32	57	23	153	38.25	11.84
May . . .	30	23	33	16	102	25.50	7.89
June . . .	10	34	24	17	85	21.25	6.58
July . . .	15	59	21	12	107	26.75	8.28
August . .	20	20	25	15	80	20.00	6.19
September .	12	20	22	13	67	16.75	5.19
October . .	17	17	13	15	62	15.50	4.80
November .	31	22	18	13	84	21.00	6.50
December .	24	30	18	29	101	25.25	7.82
Total . .	342	353	391	206	1292	323.00	100.00

MEDICAL DISEASES

THESE diseases will be considered in the order given in the preceding tables.

Small-pox.—Before the introduction of vaccination into these States, small-pox epidemics were frequent and widely spread, and the mortality among children was then, undoubtedly, enormous. Marks of the disease, contracted in childhood, are still visible on nearly every adult in the country, and many of them suffer from lost or impaired vision, due to this dire malady. A reference to the article headed "Vaccination," and the tables given there, should be made. When vaccination was first started it met with much opposition from the people, and the limited number of vaccinators, available for carrying out the protection, was a further difficulty. It was not till 1889–90 that a full staff of vaccinators was entertained in Marwar; the work done since has been excellent, and most of the juvenile population has been once vaccinated. In the twelve years 1887–98, 866,960 children have been vaccinated in the Jodhpore State. The mortality from small-pox in Jodhpore city, during the four years 1894–97, has been 101 out of a total of 5448, or a percentage of 1.85 of the total deaths. The most fatal months are usually April and May; next come March and June, and very few cases, *i.e.* only one and two, have been recorded in February and July, respectively. The remaining six months, viz. the first and the last five months, have had no deaths registered during the period under review. The greatest number of deaths occurring in any one year was in 1896, viz., 88; in 1897 there were 12;

in 1894, one; and in 1895 there were no deaths from this disease. The statistics available for this table extend over only a very few years, and consequently it is difficult to give much information on the subject, as memory has to be greatly relied upon. Registration is still imperfect, and little is known in the hospitals and dispensaries regarding these outbreaks, as the people are averse to treatment for this disease, which they consider a visitation of the deity called "Sitla Mata." They rely on certain religious ceremonies, and the fate of the individual attacked, to effect recovery. The sufferer is placed in a dark room, air is excluded by thick curtains, and prayers are regularly attended to. Should the child recover, it is taken to Mata's shrine and thanksgiving offerings are made. The mortality among young children from small-pox under this system is always very great, and much blindness and impaired vision ensue. The virulence of the disease has, fortunately, been much reduced during recent years by vaccination.

Cholera.—The following mortality tables for the Jodhpore State are available only from 1889 to 1897, and for Sirohi from 1890 to 1897, both years inclusive. The mortality for the city of Jodhpore is given from 1891 to 1897, and for the Sirohi city from 1893 to 1897, inclusive.

Mortality Table, Cholera, of Jodhpore State, from 1889 *to* 1897.

Months.	1889	1890	1891	1892	1893	1894	1895	1896	1897	Total.	Average.
January . .	...	...	...	...	...	...	...	...	...	...	...
February . .	...	...	...	...	...	...	...	...	...	...	...
March . . .	...	...	..	...	2	2	...	...	...	4	0.44
April . . .	...	...	...	145	...	...	...	119	5	269	29.89
May . . .	...	...	19	1744	...	...	2	554	...	2,319	257.67
June . . .	...	...	2	4849	...	...	181	859	...	5,891	654.56
July . . .	203	...	155	1040	...	...	1	765	7	2,171	241.22
August . .	17	1	257	19	...	...	...	13	16	323	35.89
September .	...	...	128	55	...	...	...	1	7	191	21.22
October . .	...	...	25	...	...	...	...	16	...	41	4.56
November .	...	...	...	...	...	...	88	...	...	88	9.78
December. .	...	...	...	...	1	...	...	...	...	1	0.11
Total . .	220	1	586	7852	3	2	272	2327	35	11,298	1255.33

Mortality Table, Cholera, of Sirohi State, from 1890 *to* 1897.

Months.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Total.	Average
January . .	...	...	...	...	...	...	...	...	...	...
February .	...	...	...	...	...	...	...	...	...	...
March . .	...	...	...	...	...	...	...	...	...	...
April . . .	...	...	...	...	...	...	...	. .	...	...
May . . .	...	...	...	...	...	...	17	...	17	2.13
June . . .	...	...	10	51	...	10	37	...	108	13.50
July . . .	84	8	5	...	...	...	...	...	97	12.12
August . .	12	1	7	...	...	7	...	...	27	3.38
September .	...	...	10	...	...	...	...	...	10	1.25
October . .	...	...	5	...	...	...	...	...	5	0.62
November .	...	...	...	...	...	...	...	...	...	...
December .	...	...	...	...	...	...	...	...	...	...
Total . .	96	9	37	51	...	17	54	...	264	33.00

Mortality Table, Cholera, of Jodhpore City, from 1891 *to* 1897.

Months.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Total.	Mean.	Order.
January . .	...	...	...	...	...	...	...	...	...	1
February .	...	...	...	...	...	...	...	...	...	2
March . .	...	...	...	...	...	...	...	...	...	3
April . . .	..	...	..	...	...	...	...	...	...	4
May . . .	...	19	...	...	...	...	...	19	2.71	8
June . . .	...	266	...	...	...	...	...	266	38.00	12
July . . .	...	243	...	...	...	...	..	243	34.71	11
August . .	...	3	...	...	...	...	...	3	0.43	7
September .	...	90	...	...	...	...	...	90	12.86	10
October . .	44	...	...	...	...	...	...	44	6.29	9
November .	...	...	...	...	1	...	...	1	0.14	5
December .	...	...	1	...	...	...	...	1	0.14	6
Total . .	44	621	1	...	1	...	...	667	95.28	

Mortality Table, Cholera, of Sirohi City, from 1893 *to* 1897.

Months.	1893.	1894.	1895.	1896.	1897.	Total.	Mean.
January	...	...	...	...	...	...	...
February	...	...	...	...	...	...	...
March	...	...	...	...	...	...	...
April	...	...	...	...	...	...	...
May	...	...	...	...	...	...	...
June	2	...	...	...	...	2	...
July	...	...	...	...	...	...	...
August	...	...	...	...	...	...	...
September . . .	...	...	...	...	...	...	...
October	...	...	...	...	...	...	...
November	...	...	...	...	...	...	...
December	...	...	...	...	...	...	...
Total	2	...	...	...	...	2	...

The total number of deaths recorded from cholera in Marwar during the nine years 1889–1897, as shown in the first of the above tables, was 11,298, and in the city of Jodhpore, during the seven years 1891–97, 667. The total number of deaths recorded from cholera in the Sirohi State during the eight years 1890–97 was 264, as shown in the second table, and only two cases occurred in the capital during the period 1893–97.

For Marwar the years 1890, 1893, and 1894 may be considered as non-cholera years, as only one, three, and two deaths occurred from this disease respectively during those years. In the city no cases occurred in three out of seven years, and there was only one death in 1893 and one in 1895; so these years may also be said to be non-cholera. The only very bad season was that commencing in May 1892, and ending in September of the same year. The months of greatest mortality in the State were June, May, July, August, and April, and in the city June stands first for mortality, July coming next. The statistics for the districts cannot be considered very reliable, but those of the city give a fair idea of the mortality from cholera. In the Sirohi State 1894 and 1897 were non-cholera years, and the city escaped almost completely during the period given in the table.

There is no official record of cholera in these States before 1872. In April of that year cholera is said to have commenced at Chandáwal, on the main road between Pali and Ajmere, and to have spread considerably throughout the country, though the total cases and deaths which occurred are not recorded.

In 1875–76 a few cases of cholera were reported in Marwar and Sirohi, but the outbreaks do not appear to have been severe. Cases occurred in June 1875 and in August 1876. One imported case occurred at Mount Abu, the only case of cholera known on that hill.

In 1878 cholera broke out in Jodhpore city on the

29th August, and 827 deaths were reported up to the 4th of October of the same year.

In 1883 there was an outbreak of cholera at Abu Road, in Sirohi State; it began among the carrying coolies on the 29th of June, and continued till the 30th of August of the same year. There were 102 cases and 51 deaths reported, but the disease does not appear to have spread much through the surrounding country.

In 1884 cholera broke out in Pali, in Marwar, on the 5th of July, and 438 cases, with 134 deaths, were reported. The town of Pali was then in a very filthy condition. The disease extended to Sojat and other towns on this occasion, and continued till the 25th of September. It was, however, of a mild type, except at the beginning, in Pali town.

In 1885 cholera was carried up from Central India by the Ramdeora pilgrims, and it broke out in a virulent form at Ramdeora and Pohkaran, places about ninety miles north-west of Jodhpore city. As soon as the disease became established at the fair, the pilgrims bolted in the Jodhpore direction. The year was one of short rainfall in the western desert, and the Ramdeora tank was very low when the fair commenced. Water was scarce all along the route taken by the pilgrims, and they perished in numbers, of thirst and cholera, as they were driven from the wells and villages by the people. Some of the pilgrims found their way into the Surságar village, near Jodhpore, and infected the Residency wells adjacent. The Resident's escort and office establishment were attacked, as well as many people in this village; two men of the escort died of acute cholera, and the rest were sent out at once to a well two miles off, after which no other cases occurred among them, although the disease continued long in Surságar village, and spread to the city, where many people fell victims to its virulence. This epidemic lasted from the 16th of September till the 9th October,

but only 518 cases with 398 deaths were reported from Jodhpore city and suburbs; however, I am satisfied that this was far below the actual numbers who became victims to the disease in and around the city, and the village mortality must have been very great, although few reports of it were received.

In November 1886 cholera was carried into Jodhpore city and a few villages by pilgrims from Pushkar fair, but it did not assume epidemic proportions; 18 cases with 3 deaths were recorded in the city, and 15 cases with 6 deaths in villages.

In 1887 there was an epidemic of cholera which began in Marwar on the 29th July, and which would appear to have extended into this country, both from the Sirohi and Jeypore directions. During July of that year 52 cases and 25 deaths were reported from Sirohi; from Jodhpore city 547 cases and 203 deaths were reported, and from the districts 3632 cases and 1959 deaths. The infected area extended over a great part of the State, and the disease was specially virulent among the Srimali Brahmins of Jodhpore city, who were then notorious for their opposition to all sanitary measures. The outbreak used to lull and then increase with light showers which fell during August and September of that year.

In 1888 cholera was prevalent in some villages of Marwar and Sirohi during July and September. It did not appear in Jodhpore city, but 1136 cases and 703 deaths were reported from villages in Mallani, and that direction of Marwar. There were 22 cases with 5 deaths in the Sirohi city, and 47 cases with 14 deaths in adjacent villages of that State.

In 1889 there were 745 cases and 220 deaths from cholera reported in Marwar, most of which occurred in Sanchore pargana in the south-west; but there were also a few cases at Sambhar, near the north-east corner of the State.

In 1890 only one cholera case (fatal) was reported in Marwar, but there were 131 cases and 96 deaths from the disease in Sirohi State between the end of June and the end of August. Eight villages of this State were attacked, but the capital escaped.

In 1891 cholera appeared in the Nagore, Pali, Merta, Pachbhadra, Bilara, Nawa, and Jodhpore parganas of Marwar, between the 3rd of May and the end of October. During this time 906 cases with 586 deaths were reported from villages, and 125 cases and 44 deaths from the Jodhpore city. The disease appeared at Chánwán on the Jodhpore-Bikanir Railway, where it had not been known for many years; it was of a virulent type, 65 deaths having occurred out of 75 attacked. The first case occurred in a Sadhu, back from a pilgrimage to Hardwar. Five of the station employes were attacked, and they all died. In May and August of this year 95 cases and 9 deaths occurred in Sirohi.

In 1892 a severe epidemic of cholera occurred in Marwar, between the 3rd of April and the end of September; between these dates 13,532 cases with 7852 deaths were reported from out towns and villages, and 1586 cases and 621 deaths from Jodhpore city. The disease first began at Sambhar, and spread to 424 towns and villages in the State. Between the 8th of June and 18th of September three villages of Sirohi and Abu Road Station had 81 cases and 37 deaths.

In 1893 there was an outbreak of cholera in Sirohi State, between the 4th of June and the 3rd of July. In six villages of this State 115 cases and 51 deaths occurred, and besides there were 8 cases and 2 deaths in Sirohi city. Three cases and 3 deaths were reported in Marwar during this year; one of these occurred in Jodhpore city, but no epidemic followed.

In 1894 only two cases of cholera were reported in Marwar, and these were both fatal. They occurred in March in Sheo,

a pargana in the western deserts, and they were most probably not cholera but poisoning by unwholesome food.

In 1895 cholera appeared in both Marwar and Sirohi during the early part of the cold weather. It was supposed to have been imported into Marwar by camel-men who came from Berar. Three cases and one death occurred in Jodhpore city, and 404 cases with 272 deaths in the western districts. There were 60 cases reported from five villages of Sirohi, with 17 fatalities in the same year.

In 1896 cholera appeared in epidemic form at Nawa, on the Sambhar lake, on the 6th of April; it extended into sixteen parganas, and attacked 115 villages. Between the above date and the end of October 3931 cases and 2327 deaths were reported. The disease was imported from Bikanir by some coolies who had come in search of employment to the Sambhar lake, where extensive works were then being carried out. It soon spread to the town, from which many people bolted, panic-stricken, and in this way hastened the spread of the epidemic. In the same year there were 116 cases and 54 deaths from cholera reported from five villages of Sirohi State between the 8th of May and the 25th of June.

In 1897 there were 123 cases with 35 deaths from cholera reported from the famine-stricken districts of Marwar. They probably originated from unwholesome food, as during years of scarcity the poorer classes are compelled to use much old grain which has been long buried in the ground, till a year of scarcity makes it saleable to those who cannot afford to pay the enhanced prices which new grain then commands.

No case of cholera was reported in these States in 1898. The year was one of fairly abundant food, on account of the great importations of grain which took place from adjacent provinces, where it was very plentiful. Water was very scarce towards the end of the year. Most of the crops failed, or were

very light, and the grass famine, which now exists, was being felt before the end of the year.

Influenza has, during recent years, been very frequently met with in epidemic form, and, unlike the other diseases of this class, one attack does not confer immunity against a recurrence. Consequently some susceptible people suffer every time an outbreak appears, and become much reduced in health thereby. Lung complications are frequent, bronchitis being common, and pneumonia occasionally seen. The old and enfeebled suffer most severely, and many of them are carried off by this disease. Great depression and debility characterise the attacks, and a troublesome cough often remains long after the other symptoms of the disease have disappeared.

Dysentery.—There were 16,155 cases of dysentery treated in the hospitals and dispensaries of the Western Rajputana States, including those of jails, during the period of eight years, 1890–97, of which 12,489 were in Marwar, 1619 in Sirohi, 852 in Jaisalmir, and 1195 in Abu and Abu Road. The disease is not a very common one in these States, nor is it often seen of a very severe type, being generally sub-acute in the first stage. It is frequently brought on by the use of bad grain and unwholesome fruits, but impure water is undoubtedly the most important factor in its production; exposure to damp and chill in the rains and cold weather also sometimes brings on the disease. Of 2269 cases treated in the Hewson Hospital, 327 were seen in August, 387 in September, and 259 in October. It is always most prevalent in the damp season of the year, and it is frequently connected with and aggravated by malarial fever.

Malarial Fevers.—In a dry climate like that of these States, with few rivers, tanks, and marshes, also with the sub-soil water at a great distance from the surface during most of the year, and where mosquitoes are not very plentiful, malarial fevers and their complications are essentially less common than in

many other parts of India. These affections are, however, even here the common ailments of the people, and hardly any one escapes an annual attack of fever, while many suffer frequently. Some always present the visible signs of malarial cachexia (the result of the malarial plasmodium in their blood), viz., great anæmia, lassitude, emaciation, and enlargement of the spleen. The cases seen at the hospitals and dispensaries are not a tithe of those attacked; most of the people are so accustomed to suffer from malarial fever that they think little more of it than of a cold, and they have their own domestic remedies on which they rely; while others are too apathetic to seek relief, looking upon the disease as a visitation of the Deity which must be endured, and taking to their bed till it has worked itself out, or in extreme cases ended fatally. Many of the villagers of these parts think that a sharp attack of malarial fever clears the system, and leaves them lighter and better for the rest of the year, just as an annual drastic bleeding was at one time considered salutary in the West.

Some of the better classes are, however, taking to the use of quinine, which they now accept as a potent remedy against malarial fevers, and it is hoped the sale of the drug at post-offices will facilitate their obtaining it when required. The attendance at the hospitals and dispensaries further demonstrates that relief from these diseases is being sought by many. In the Marwar hospitals and dispensaries during the eight years' period, 123,837 cases were treated for these affections, out of a total of 592,834. It is further well known that the hospital assistants and practitioners are much more called in for the treatment of fevers than formerly, and that their instructions for the relief of the disease are also better carried out. Cases of malarial fevers are met with at all times of the year, but the period of maximum prevalence is from August to November, October being generally the most feverish month here. Of 68,520 cases of malarial fever treated in the ten

principal dispensaries of Marwar during the eight years' period, 15,417 were seen in October; and of 31,271 cases treated in the Hewson Hospital, Jodhpore city, during the same period, 7314 were also in October. In Mount Abu and the hill country malarial fevers generally set in a little later, the end of October and November being the most feverish time, and the prevalence sometimes continues into December. Of a total of 8453 cases treated during three years in Abu and Abu Road charitable dispensaries, 1521 were in October, 1305 in November, and 1005 in December.

The period of greatest exemption from fever is March to July, the hottest months having the fewest cases of malarial fever, and June being generally the month of greatest exemption from the disease. As soon as the rains set in, whether in the hills or plains, fever begins to increase, and runs steadily up to the maximum in October.

The delta and districts of the Luni river are the most feverish parts of Marwar, and in years of heavy rainfall, when this river overflows its banks, the prevalence of fever is so great, and it continues so long into the cold weather, that I have frequently seen the entire population suffering more or less from its effects, and hardly able to sow the wheat, although very little more than scattering the seed over the vast area fertilised by the silt carried down in the monsoon floods was required from the husbandman to produce an excellent crop. The most malarious parts of Sirohi are the villages at the base of the hills in the densely wooded country, and the inhabitants of some of these villages seem to have deteriorated in physique on account of fever. The degenerating effects of this disease may also be readily observed, if the well-grown and vigorous inhabitants of the high, barren lands of Mallani and Jaisalmir, who have to struggle for food, be compared with the dwellers in the low-lying delta of the Luni, where wheat is abundant and always cheap,

but where, nevertheless, the physique is generally poor and the temperament phlegmatic.

The researches of Major R. Ross, I.M.S., have demonstrated that some species of mosquito harbour the malarial parasite during a part of its existence, and that they are potent factors in the distribution of malarial poison and in the communication of malarial fevers to man and animals liable to these diseases. This has been accepted by Laveran, the discoverer of the malarial plasmodium, and the experiments made by Ross have been confirmed by Grassi and other scientific authorities on the continent of Europe and here. Moreover, it is in accordance with the ways of nature for the mosquito to make use of the malarial plasmodium as an irritant to bring the blood it wants to the surface. A bad biting by mosquitoes has long been known to produce malarial fever in new arrivals in the country. It must, therefore, now be accepted that the Indian spotted-winged mosquito, and some other varieties, can implant malarial virus in the system, and that this is one if not the only source from which malarial fevers are derived. The stagnant pools and water-logged localities in which these mosquitoes are bred have long been recognised as the great malarial producing places. However, dense forests and overgrown tracts, where there is much decayed vegetation and where the sun and air cannot gain access to the soil, have always been known to be very feverish districts, and the thorough ventilation and exposure of the soil to sunlight dissipate the malaria of such places, as if the decaying vegetation were necessary for its production. Further, many of the people of this country believe that they take in the malarial poison with impure drinking water, and they will even fix the source and refer to the draught of water which brought on the attack. I have known of malarial fever contracted at sea, three miles from the coast of Africa, where mosquitoes could not reach, and where it

was supposed to be due to direct infection from the many sufferers on board the hospital ship there. A disease so widely distributed over the globe, and so prevalent in many places, is not unlikely to have several ways of gaining access into the system, and its germs may have an independent existence in vegetable matter and in water, where the mosquito may play a further part in its distribution when it returns to the water to leave its larvæ and die there. However, although the subject has not yet been worked out sufficiently to satisfy all the observations of experienced clinicians, the researches of Ross have thrown a new light on malaria, which it is hoped will lead to the complete solution of the problem at no very distant date.

The Europeans here and most of the well-to-do of the country live under better hygienic conditions than the poor, and in consequence suffer less from malarial fevers. Experience has shown that much can be done to lessen the prevalence and reduce the severity of these diseases, even among the poorer classes of the country. Habitations should be located on high, dry sites, the sub-soil water thoroughly drained off, and stagnant pools must never be allowed near dwellings. A supply of pure drinking water is of the greatest importance, and this is too often overlooked by villagers. Dense undergrowth requires to be regularly cut away from the vicinity of villages to allow the sun and air to gain free access to the soil; the lower branches of trees should also be removed, so as to admit of thorough ventilation and sunning of the ground under them. Houses ought to be built on well-raised plinths, and the floors should be of wood, lime, or stone instead of clay when practicable. High roofs are essential for pure air, and they ought to be absolutely waterproof. Ventilation must be thorough, and windows to admit plenty of air and sunlight are essential. Marsh miasma should be shut off from villages by growing belts of trees on any available land between, and

ventilation at night made from the opposite side of the dwelling. Sleeping on beds or "charpais," instead of on the ground, is a safeguard against fever; and those who have to spend their nights out of doors watching their crops, should have raised "machâns" or resting-places to keep them above the malaria. Upstair rooms should be occupied when possible during the fever season, and chills should be avoided by the wearing of proper clothes, and by keeping within doors after sunset during the unhealthy months, as malarial fevers are more readily contracted out of doors than within at the time of year when the poison is active. Attention to diet and avoidance of over fatigue are wise precautions during the fever season, as anything which lowers the system tends to give the germs of disease an advantage over the provisions of nature for the removal of noxious matter from the blood.

Those liable to fever will derive much benefit from the use of a prophylactic during the unhealthy months, such as quinine or arsenic, and a dose of quinine is a useful precaution when great exposure to night air or damp has to be undergone. The people of the country rely greatly on infusions of the leaves and shoots of "nim" (*Melia indica*), and many of them take this beverage every morning during the fever season, with much benefit to their health, and it is both prophylactic and curative in malarial fevers. Decoctions of ginger, black pepper, and "nimgiloe" are other remedies, with a high reputation throughout the country for prevention and cure of malarial fevers. Many of the people have much faith in tea to ward off or cut short attacks of fever, and opium is much relied on to prevent and cure these diseases. Although quinine is undoubtedly the first remedy against malarial diseases, many of the people of this country compare it unfavourably with their own remedies, and say that it increases their headache, gives them constipation, a dry skin, and palpitation. It should, therefore, be prescribed with remedies which counteract

these sensations in order to make it popular. Antifebrin, phenacetin, and remedies of this class are becoming popular in many of the towns as fever remedies; and although they are less curative, they bring about perspiration and a feeling of ease, which makes them grateful to the fever patient. They should, however, be taken with caution, as they are lowering, and sometimes give rise to alarming symptoms.

Venereal Diseases.—These diseases are fairly common among the people of these States; but a very severe type of syphilis is only occasionally met with, and this is often due to the abuse of mercury, which is prescribed to excess by ignorant and unqualified practitioners in the form of "Ras Kaphur" (Hydrargyri perchloridum). Gonorrhœa is very common, as might be anticipated from the customs of the country. Early treatment is generally resorted to, and when this is not successful at home many people seek advice at the hospitals and from practitioners. Primary and secondary syphilis are common diseases, both at the hospitals and in private practice. They are mostly treated by mercury in the early stage; not unfrequently, however, this drug is given to excess, with detriment to the patient. Tertiary syphilis is met with, and the hereditary form is also sometimes seen; the latter gives rise to a considerable mortality among infants. In the period of eight years, 5747 cases of gonorrhœa, 4351 of primary and 3558 of secondary syphilis were treated in Marwar hospitals and dispensaries.

Scurvy.—In eight years there were only 195 cases of scurvy treated in the Hewson Hospital, and only 1183 in all the hospitals and dispensaries of Marwar. It cannot therefore be considered a very prevalent disease in this part of the country. My experience is, that it is only met with among the underfed and poorer classes, and that it is hardly seen in years of plenty. Although vegetables are never very plentiful in these States, where water is mostly scarce, the people in

some way manage to get radishes, leeks, mint, wild leaves and roots during certain seasons of the year, which they eat raw, and which are in this condition strongly anti-scorbutic. Limes, tamarinds, and preserved mangoes are in common use, and these do much to make up for the scarcity of fresh vegetables.

Worms.—Guinea-worm is very common all over this part of the country, and many of the contracted limbs and stiff joints seen are due to the irritation set up by this parasite, which finds its way into the body through the use of foul tank water. Thread-worms are common in children, but round and tape-worms are only occasionally seen. Guinea-worm is readily extracted by some of the dressers and compounders at the hospitals, and by village specialists in this branch; but the operation must be undertaken before the blister forms at the point of exit.

Debility and Anæmia.—Malaria is responsible for much of the debility and anæmia met with. Want of sufficient nutritious food, dyspepsia, bad teeth, and old age may also be mentioned, and uterine diseases not unfrequently also bring this condition about. Great mental depression is often seen among some of the sufferers from these affections. Mental worry, heavy pecuniary losses, family misfortunes, the death of a near and dear relation, and shock bring about a listless and debilitated condition, which in some people of this country runs on to a fatal termination, as if the individual no longer desired life. Debility is also sometimes induced by parsimonious habits, the individual being too fond of saving to spend sufficient on his diet. I have known cases of this sort in a regiment, where a portion of the sepoy's monthly pay had to be given to the "*Bania*," who provided the proper amount of food, which would have been wasted if the men had not eaten it. This remedy has generally had the desired effect of getting such men into proper condition and health.

Rheumatic Affections.—Chronic rheumatic affections, both of

joints and muscles, are common in the cold weather and rains, but acute rheumatism is of rare occurrence. It is incumbent on Brahmins and strict Hindus to bathe in cold water in the early morning; consequently they leave their warm houses and go to the nearest well, where they pour cold water over their bodies, and dry themselves in the cold wind, after which they wash their loin-cloths and reapply them in the damp state. This drives the blood from the surface, and perverts secretion, so an attack of lumbago or a joint affection often follows, especially in the old and feeble. Some of the poorer classes, who have no change of clothes, sit in the wind to dry themselves after they have become drenched by a shower, and this is another frequent cause of rheumatism. Camel-men, who carry across the desert, are exposed to great ranges of temperature, the day being always hot, the night intensely cold; they are generally under-clothed, and therefore suffer much from rheumatism. The actual cautery is still sometimes resorted to by the people for the cure of some of these severe rheumatic ailments; but oil-rubbing is generally relied upon as an external remedy, and opium is taken, both for cure and prevention.

Tubercular Diseases.—There have been 573 cases of tubercular disease treated in all the Marwar hospitals and dispensaries during the period of eight years; 166 in Sirohi during the same period; 33 in Abu and Abu Road in three years; and only 3 in Jaisalmir in five years. The disease is not common in these States, and what is seen is mostly among females who live greatly within doors. Milk is rarely a vehicle for the communication of tuberculosis to man in this country, as cows live mostly in the open, and are not subjected to infection, like the house-fed dairy animals of Western cities.

Leprosy.—There is a leper-home at Kágá (already referred to), outside Jodhpore, where most of the lepers of the surround-

ing country congregate and are fed by the people. The disease is not common in these States, and only 215 cases have been seen in the Hewson Hospital during the eight years' period. There is no reason to believe that the disease is on the increase, so far as can be ascertained from the leper-home here, although this was at one time feared, and the statistics given by the Administrative Medical Officer in Rajputana for 1897 show a decrease for the whole province. Cases of leucoderma are sometimes seen, and treatment is sought on account of the disfigurement produced by the disease, more than on account of any other inconvenience it gives rise to.

All other General Diseases.—Epidemics of measles, typhoid fever, and chicken-pox are of occasional occurrence, and I am of opinion that most of the children of this country get over typhoid in their childhood. Enteric fever is sometimes difficult to diagnose in Orientals; but I have seen numbers of undoubted cases, and most of them in young people. Diphtheria is very rare in these States, but hydrophobia is seen from time to time, both from dog and jackal bite. Typhus fever is unknown, and erysipelas is extremely rare; but epidemics of influenza have become common during recent years, and it runs the same course as in the West. Whooping-cough appears in epidemic form, but it receives little notice from parents, and is never very severe.

Diseases of the Nervous System.—Neuralgia is very common in the anæmic, especially women, and it is often of malarial origin. The hemicranial variety is most frequently seen, but facial, sciatic, and other varieties are not uncommon. Epilepsy is seen from time to time, also shaking palsy. Partial paralysis is frequently met with, consequent on apoplexy, syphilis, and other lesions due to disease or injury. Muscular atrophy and locomotor ataxy are not common, and chorea is comparatively rare in the children of these States.

Diseases of the Eye, Ear, and Nose.—These diseases con-

tribute largely to the dispensary returns, but as they sometimes require surgical aid, they will be shown under that heading.

Diseases of the Circulatory System.—Diseases of the heart and blood-vessels are very rare as compared with what is seen in the West. Rheumatic fever is uncommon here, and the placid temperament and temperate habits of the Oriental save his circulatory system much strain; consequently aneurism is hardly ever met with, and even varicose veins are not very common. Functional diseases of the heart are met with in the anæmic, especially among women who have been reduced in health by prolonged lactation and want of fresh air.

Diseases of the Lungs and Respiratory System.—There were 5881 cases treated in the Hewson Hospital during the eight years' period under this heading. There is an infectious form of pneumonia sometimes prevalent in the cold weather, and the disease is often complicated with, and consequent on, severe malarial poisoning; the pneumococcus and malarial plasmodium being undoubtedly able to accommodate themselves in the same system and with great detriment to the patient; consequently this compound disease is often fatal. Supporting and stimulating treatment combined with good nursing are required for these pneumonias; but both religious prejudices and caste customs get much in the way in this country. Most of the people refuse to take milk when suffering from lung affections, and many Hindus are strict vegetarians; so, when they are ill, they subsist on gruels and millet waters with little or no sustenance in them, and nothing to support the system against an exhausting fever. Alcohol is forbidden to most Hindus and all good Mahomedans, and even medicinal tinctures and fluid medicines are refused. These people are generally nursed, even in hospitals, by their relations, as they object to the hospital servants, who have to be general, and are employed to take care of some of the lower castes. It will therefore be understood that nursing is still in a primitive condition here,

and that the patients must often suffer from want of skill in their nurses, however attached to them their relations may be, and no matter how much devoted to the duty which devolves upon them in consequence of an illness in their own family.

The want of skilled nursing among the people is not less felt in dealing with cases of enteric, and this disease is also rendered unnecessarily fatal by caste and religious prejudices, which make proper dieting and treatment an impossibility. Many of those suffering from enteric are fed solely on millet water for a time, and then put on coarse bread long before they are able to digest solid food, often with a result that is anything but satisfactory. Live flies are given as an aid to diagnosis, and to assist in driving the disease from the system; this treatment often produces a severe retching which is not readily recovered from, and which lowers the patient to an alarming extent, in most instances when support is needed.

Acute bronchitis is sometimes met with as a complication of influenza, and the chronic variety of the disease is common enough in the cold weather among the old and feeble. Asthma is not an uncommon complaint in this part of the country, and the dry air impregnated with fine sand often adds to the sufferer's distress. Pleurisy of an uncomplicated kind is rare.

Disorders of the Digestive System.

Diarrhœa is common during the monsoon season both in children and the advanced in years, and it is not unfrequently fatal. Damp clothes, chills, and perversion of the normal secretions, unripe and unwholesome fruits which come into the bazaars at that season, bad grain and impure water, are all potent causes of this malady, and both the severity and fatality of this disease are enhanced by malaria, which is ever ready to work evil in the system reduced below par, no matter what the first cause of this may be.

Dyspepsia is a common ailment of the poor, because they are irregularly and also underfed; and of some of the well-to-do because they are overfed, and their diet too rich and too highly spiced. Women suffer greatly from this affection on account of being so much indoors and from want of exercise.

Diseases of the Liver.—Congestion of the liver is not uncommon, especially in those addicted to alcohol and very hot curries; it is also seen with malarial poisoning. Hepatitis is met with in the same classes, but it rarely runs on to suppuration, and I have only seen three cases of abscess of the liver at the native hospitals, two of which recovered after operation.

Diseases of the Spleen.—Enlarged spleen is common in all the malarial districts, even in children. It may be found hard or soft, and sometimes it is enormously enlarged and complicated with ascites. It only yields satisfactorily to treatment when the patient can be removed in the early stage from the malarial influences. Splenectomy has not been tried, and the people of these parts would not submit to it under any circumstance.

Diseases of the Lymphatic System.—Enlarged lymphatics are not common; they are sometimes removed, and sometimes reduced by local applications.

Goître.—This disease is uncommon; only three cases have been seen in the Hewson Hospital in eight years, and I have seen only two others outside.

Plague.—Plague broke out in Pali about the middle of July 1836, and extended from there to Jodhpore city, Sojat, Kherwa, and many other towns of Marwar, also to Sakola and two or three other villages of Meywar.

Pali, where the disease broke out first with great virulence, is on the main road between Ahmedabad and Ajmere. The town is built on a stiff clay soil, the drainage is bad, and at certain seasons, when the tanks are full, it is water-logged. The tanks during the monsoon season are filled from a river

which has a dam about three miles above the town to divert the water, and the site of the town is considerably lower than that of the dam. The principal streets of Pali are fairly wide, but the side streets are all narrow. The houses are substantially built, mostly of burnt bricks, and the principal inhabitants are well to do, as there has always been a prosperous trade carried on in cloth-stamping and dyeing. At this period the population of Pali is supposed to have been about 25,000 souls, although it is now under 18,000, and trade has considerably diminished in it during recent years.

Plague was supposed to have been imported in silks from China, or brought to Pali from Southern Gujerat by a large party who had been with Zorawar Mal Seth on a pilgrimage to that part of the country, and who halted for some days in Pali on their return. The disease broke out in Pali shortly after the departure of this party from the town, but it has not been established that the party had the disease among them, nor even that plague was then present in any part of India. The disease first broke out among the cloth-stampers, and it was reasonably supposed by some that it might have been introduced through the imported silk cloths. Most of the materials imported to be stamped were from England, but silks were imported from China and abroad, and all importations were *viâ* Bombay. The disease rapidly spread from the cloth-stampers to all other classes and castes, but Malis, Chamars, and Telis are said to have suffered less than Mahajans and Brahmins—the former lived more in the open.

The epidemic was at first fatal to nearly all attacked, and fifty or sixty a day died in this town. Wood for burning corpses became so scarce and expensive on account of the enormous mortality that cocoa-nuts and ghee were used for this purpose.

As soon as the disease became well established the people got panic-stricken, and fled from Pali to Sojat, Jodhpore,

Kherwa, Chandawal, and other towns, where they communicated it to the inhabitants. Many of the people left their property behind, they were so terrified. When Assistant-Surgeon Maclean, of the Merwara battalion, then stationed at Beawar, visited Pali, about the second week in October 1836, there were not more than a thousand people in the town.

The disease continued to work great havoc among this reduced population, and only died out about the end of October, when the town was almost deserted.

Sojat was early attacked. It was then a town of 15,000 or 20,000 inhabitants. It is on the main road, twenty miles from Pali, and many of the refugees from Pali settled in it. Dr. Maclean visited Sojat, and found that the Pali refugees had started the disease there, and that the deaths were from twenty to forty a day.

In Jodhpore city the disease broke out with great virulence a short time after some Pali people had settled there. The population was then about 50,000. The people are said to have died at the rate of sixty to ninety a day, and about 600 or 700 had perished before the middle of October 1836. There was an abatement in the disease for a short time, although it does not appear to have ceased during the cold weather, and it only finally disappeared at the beginning of the hot season of 1837. Lung complications were more general, and spitting of blood was a more common symptom of the disease in Jodhpore than in Pali, while buboes were less common in the former than in the latter outbreak. The epidemic in Jodhpore was attributed by some to a strong south wind, and the recrudescence is said to have been brought about by a return of this wind.

The disease prevailed in many villages of Marwar from October 1836 till March 1837. It was introduced into Sakola in Meywar by an astrologer, who went from Pali and put up in the house of a Brahmin of that town. The Brahmin,

his wife, and others died in the house after the death of the astrologer. The disease spread and nearly depopulated the town. Kankroli, another village of Meywar, suffered severely, but there is no record of plague having got into Oodeypore city, nor did it reach Ajmere, although the Pushkar fair and dargah were both held during the time it was prevalent in Marwar.

Dr. Maclean, who visited both Sojat and Pali during the epidemic, satisfied himself that the disease was plague; the attack generally came on suddenly, with rigours, headache, pain in the back and loins, and sometimes nausea; the skin became hot and dry, the pulse quick and soft, frequently running up to 150; the tongue was coated, often brown; vomiting uncommon, but sometimes painful retching; the abdomen was generally hard, and there was no diarrhœa; the eyes became suffused, and the countenance heavy and anxious early in the disease; buboes formed in the groin, armpits, or neck on the first or second day of the fever; and pneumonia, with distressing cough, rusty sputum, and dyspnœa was a common complication. Coma generally set in before death, which often occurred on the third day of the disease. If the patient got over the third day there was a chance of recovery, and large suppurating buboes were considered favourable. The buboes were most common in the groin, and they were more general in the Pali than in the Jodhpore outbreak, in which pneumonia was a very frequent complication, consequent on the lower temperature at the season when the outbreak occurred in Jodhpore.

Many precautions were taken against the spread of the disease towards Ajmere. Quarantine posts were established, and both people and goods were stopped on the border between Ajmere and Marwar. The Maharaja of Jodhpore was asked to prevent his people from attending the Pushkar fair, and also to keep healthy villagers from communicating with

infected, and many of the people protected their own villages by not allowing refugees from plague-stricken places into them. It was remarkable that many of the small villages around Pali and other infected towns escaped, and this was believed to have been due to refugees not having gone into them, and to the small communities having agreed to keep away from plague-stricken towns. Money was received by many people from the infected in cups of vinegar to prevent contagion.

Quarantine posts were established on the Bombay roads, and traffic was greatly interfered with on all sides of Marwar, though not completely stopped. Fumigation was resorted to at some posts, but does not appear to have effectually carried out. Goods traffic was even more dreaded as a means of disseminating the disease than people. So articles were frequently burnt, and the ashes, both of these and of corpses, were ordered to be deeply buried, as the virus was believed to remain potent even after burning, and to be spread by the ashes being blown about.

Dogs and cats were supposed to carry the poison from house to house, and also rats, which died in numbers during the epidemic.

There was little done in the way of treatment; once lung complications appeared, the case was considered hopeless, and both vaids and hakims fled from the infected places, and declared they knew nothing of the new and terrible disease, nor of its treatment.

Infusions of *nim* (*Melia indica*) leaves, infusion of onions, and the urine of the ass, were given internally; poultices of *nim* leaves, onions, and red pepper (*Capsicum fastigiatum*) were applied to buboes; bleeding from the arm and leeches to the buboes were resorted to, but without effect. Escarotics were applied to the buboes, with no better results than the other remedies. The body was rubbed with oil or ghee, both as a

curative remedy and as a prevention against infection. The wearing of oilskin while in contact with people suffering from the disease was believed to be a useful precaution. Dr. Maclean was of opinion that there was no danger of infection in the open air, and that the people contracted the disease in the badly ventilated houses, which had become saturated with the poison. European methods of treatment were unknown in Marwar at that time.

The Pali plague, *ghanth-ki-mandagi* or *ghanth-ki-jwar*, which destroyed the rats in great numbers, and carried off thousands of the inhabitants, is still remembered by some old people in Marwar, and it was undoubtedly the same disease which recently prevailed in Bombay and other adjacent parts of the country.

During the months of October, November, December 1896, and January 1897 thousands of people fled from Bombay and other places in that direction to Marwar, Bikanir, Sirohi, Jaisalmir, and Ajmere, in order to escape from plague. Sixteen deaths from plague and suspected plague were reported, viz., four at Abu Road, two at Jawalia, three at Marwar Junction, one at Beawar, two at Ajmere, one at Phalera, two at Jeypore, and one at Nadbai, near Bhurtpore. An undoubted case of plague recovered in the segregation camp at Bandikui; the subject was a sepoy of the 13th Bombay Infantry, who was taken from the train *en route* from Deesa to Bhurtpore on leave. The disease was then prevalent in Palanpur, and in some other villages near Deesa. Four recoveries from undoubted plague occurred in the camps at Abu Road and Marwar Junction, and many suspected cases, taken from trains, recovered in the different plague camps on the line of railway throughout Rajputana.

Segregation camps were established at all the important stations along the lines of railway which run through Rajputana, and great vigilance was exercised, both by the medical officers on special plague duty at Ajmere and Bandikui, and by the

medical subordinates in charge of the other camps, to keep people suffering from plague from travelling. This undoubtedly did much to prevent the spread of the disease. The Marwar and some other Darbars issued orders to their officials to keep refugees from infected areas in quarantine outside the towns for ten days after their arrival, and although this was not invariably carried out, it roused the people to a sense of danger and to assist in the protection of their houses, producing a good effect generally. The season was greatly against the spread of plague in Rajputana. The monsoon rains were over early, the winter rains were unusually light, and the country was in consequence exceedingly dry; the hot weather also began earlier, and the heat was more intense than usual; so all these conditions were unfavourable for the multiplication of the plague germ and the spread of plague among the people.

Whenever a suspicious death occurred among the Bombay refugees in Marwar, the house in which it took place was evacuated, and disinfected or burnt down. The occupants were put into quarantine outside the town for a period of ten days. Reports on the health of the townspeople were made during this time, so that any outbreak could have been dealt with early.

During the epidemic in Palanpur, on the Rajputana border, many people fled to Abu Road, Marwar Junction, Ajmere, and Jeypore. They were kept in the quarantine camps at these places for a time, and then sent back to their districts without being allowed into the towns.

The Sirohi villagers were warned against communicating with Palanpur and the infected villages in that district, and a guard was placed on the main road leading from Palanpur into the Sirohi State to prevent intercourse.

The pilgrim traffic between Mount Abu and Abu Road was completely stopped, and quarantine of ten days was imposed on people coming to Abu from infected districts: this measure

effectually prevented the overcrowding which always takes place in the Abu bazaar during the hot weather, and no doubt saved the place from an invasion when plague was epidemic in Palanpur, two stations from Abu Road on the main line.

1897–99.

The Rajputana border has been extensively exposed throughout the Bombay epidemic to plague infection on account of its position. Moreover, the enterprising character of the Marwari takes him all over India to engage in trade; and although these traders spend most of their lives abroad, they keep up houses and family connections in their original towns and villages in Rajputana. Consequently, when plague broke out in Bombay and the Deccan, their return in thousands was only what we anticipated, and extensive observation camps had to be arranged all along the lines of rail and road, as well as outside the cities, towns, and villages throughout the province, to ensure their thorough disinfection and prevent their carrying the germs of the disease into their homes, either in their persons or clothes.

Occasional deaths from plague occurred among the refugees. There were thirty cases and twenty-two deaths among Bombay passengers, taken from the train and segregated along the lines of railway.

In the middle of November 1897 a wealthy Seth found his way into the village of Teuri in Sirohi State, and died there of plague. His funeral ceremony was well attended, and it was very soon followed by an outbreak of indigenous plague in this and three other villages adjacent. The villages were early vacated and disinfected, and the outbreak seemed to stop after this; but the weather was extremely cold at the time, and the people could not be kept out of their houses; so other cases soon occurred after reoccupation. At the same time Poona

refugees were attacked in the town of Kalindri, which had a population of over 4000 inhabitants, and was only two miles distant from one of the villages early infected.

Plague was at first confined to Poona refugees and their families and connections, but it afterwards spread to others in the towns, and even to some of those residing at their wells some distance away.

As soon as the recrudescence took place the towns were all again promptly vacated and the people kept out in camps. The encampments were widely scattered over the fields. The huts were burned, and the sites changed when cases occurred in them. Those exposed to infection were freely disinfected, and the sick and their attendants were carefully segregated. Nevertheless cases continued to occur till the hot weather had well set in.

Between November 1897 and the 25th April 1898, there were 166 indigenous cases and 143 deaths in five villages of Sirohi State.

The disease was of the pneumonic type, and very rapidly fatal at first; but afterwards glandular swellings were common, and some recoveries took place.

Little was attempted in the way of treatment, as the people were imbued with a strong belief that the authorities wished to poison all those attacked, to prevent the spread of the epidemic, and some of them even considered the doctor's touch fatal.

There was no recrudescence of plague in the Sirohi villages after April 1898, but during the cold weather of 1898 and 1899, fourteen cases, of which thirteen proved fatal, were imported into Marwar and Sirohi from the infected area on the Bombay side. They were segregated as soon as they arrived, consequently the disease did not spread.

During the outbreak of plague in Sirohi, Captain J. W. Grant, I.M.S., lived alone in the infected area for many months,

and the suppression of the epidemic was mainly due to his untiring zeal and management of the people.

Hill Diarrhœa is occasionally met with on Mount Abu in epidemic form. It is often the result of chill due to damp, or the neglect of warm clothing in new arrivals from the heated plains, also sometimes to a relaxed condition of constitution and perverted action of the liver. New arrivals at hill stations should guard against the sudden suppression of perspiration, which invariably takes place if warmer clothing than they have been in the habit of wearing below be not adopted until acclimatisation has been accomplished. Sleeping out of doors has also to be avoided by those new to the hills, on account of both this ailment and a rheumatic condition brought on by night exposure. Hill diarrhœa generally yields to antiseptic remedies, and a return to the plains or the seaside is only occasionally necessary. At the request of the editor of the "Indian Medical Record" I published a detailed account of this disease in the January number of that Journal for 1895.

SURGICAL DISEASES

BEFORE proceeding with surgical diseases, I may point out that there were only three out-dispensaries in Marwar up to the year 1888, after which new dispensaries were opened from time to time, and there are now twenty-two of these institutions.

During eight years, from 1891 to 1898, there were 54,828 operations performed in the hospitals and dispensaries of Marwar, Sirohi, and Jaisalmir, with sixty-seven deaths from all causes, including deaths from incurable diseases.

Of the total operations performed, 219 were lithotomies, with 22 deaths, or 10 per cent., and eighty-two litholapaxies with five deaths, or 6 per cent. Lateral lithotomy has generally been performed; the supra-pubic operation has only been done when the stone has been unusually large. There has been a low mortality, both from lithotomy and litholapaxy, although many of the people of these States put off the operation unusually long, and make other difficulties against recovery. Mothers will sometimes carry their children off from the hospital to a long distance after the operation has been done, and some of the men will wander about the town in the night after litholapaxy. Recently, when I had performed litholapaxy very satisfactorily in an old man, an habitue of hemp and opium, the patient left the hospital stealthily in the night, broke his thigh by a fall, and sat out in the cold till morning. There were ten deaths after amputation of limbs; of these, three followed thigh, and seven, leg, shoulder, arm, forearm, and foot amputations, in cases where

there had been great injury and shock. Two deaths followed removal of the fœtus from the uterus, on account of septic poisoning, and eleven followed tapping of the abdomen for dropsy; these deaths were all due to disease rather than to operation. Tapping the bladder has been twice fatal, but the patients were both moribund on admission.

Tumours.[1]—Non-malignant tumours are common, but the people resort to all sorts of local applications and the actual cautery before they allow them to be removed. However, this is mostly done successfully when they subject themselves to the knife after they have failed with other applications. Mycetomatous tumours are very common, especially in Marwar. 278 operations were performed for this disease in eight years, and both the dark and pale varieties are met with. Fatty tumours are also common, 172 having been removed during the eight years' period, besides 102 fibromatous, 49 sebaceous, 44 cystic, and 4 adenoid.

Abscesses.—During the eight years' period there have been opened 6486 abscesses of all kinds, 210 of which were in the thigh and three in the liver. Many of the people are very dilatory in having these affections treated; however, our results have generally been very satisfactory.

Operations on the Eyeball and its Appendages.—During the eight years' period there have been 1386 operations on the eyeball and its appendages, of which 1084 were extractions of the lens for cataract, 6 for staphyloma, 65 iridectomies for glaucoma, 13 for artificial pupil, 1 for solution of lens, 7 for hypopion, 1 for tattooing of cornea, 1 for laceration of opaque capsule, 31 for pterygium, 28 for lachrymal fistula, 1 for epiphora, 26 for trichiasis, 97 for eutropion, 3 for new growths, 3 for symblepharon, and 5 for granular lids.

The important points in the extraction of the lens for cataract are to make a large iridectomy, and to remove the

[1] Figures for this part of the "Note" are only for Marwar.

lens in its capsule if possible, always under the influence of cocaine. The escape of a little vitreous does no harm, and the removal of the capsule ensures a clear eye and lessens the chance of inflammation. It is better to remove both lenses at the same time if they be ripe or nearly so, and the iridectomy should be done at the time of extraction. When one lens has been removed before the other, the eye is always irritable during the second operation and the lens much more difficult to extract; moreover, the patient is always more sensitive and cocaine does not act so well.

Operations on Head and Face.—The nose is sometimes cut off as a punishment for infidelity, and also for revenge. I have done 10 rhinoplastic operations for restoration of the nose in the eight years' period. I never divide the pedicle, and this prevents atrophy of the flap and gives elevation to the organ at the base, materially improving the shape. 117 foreign bodies, and 31 nasopharyngeal polypi have been removed, and 16 pluggings of the nares performed for epistaxis. Elevation of depressed pieces of bones of the skull have frequently been done; one trephining performed, and portions of the jaws removed. The tongue has been partially amputated; plastic operations for cleft palate performed, and the tonsils three times excised.

Operations on Arteries.—Ligature of arteries for disease is not common, and, as has already been explained, aneurism is very rarely met with. On seven occasions arteries have had to be tied after injuries from wild pig. Varicose veins are rare, and have only twice been operated on.

Operations on Respiratory Organs.—Tracheotomy is very rarely necessary; paracentesis of the thorax is uncommon, as there are few cases of pleurisy with effusion or empyema.

Operations on the Digestive Organs.—219 operations have been performed during the eight years' period, the principal of which were as follows:—Operations for imperforate anus, 4;

removal of hæmorrhoids, 33 ; paracentesis of the abdomen, 105 ; removal of cancer from rectum, 1 ; radical cure for inguinal hernia, 18 ; and fistula in ano, 13. Reduction of hernia and of prolapsus of the rectum has been frequently done. Ascites is treated more frequently by sulphate of magnesia than by tapping, as the after effects are generally more satisfactory. The patient is made to fast for a day and also to abstain from fluid ; then two ounces of the drug are given, and this removes much of the fluid and generally relieves dyspnœa.

Hernia.—Hernia is frequently seen, inguinal being the most common, and cases of strangulation have occasionally been treated, both in the hospitals and outside. Taxis has generally been found sufficient for reduction, but the radical cure has been performed whenever the patient has allowed it.

Operations on the Urinary Organs.—During the eight years' period 1053 operations have been performed on the urinary organs, of which 186 were lateral, 1 suprapubic, and 4 median lithotomies. 81 litholapaxies have been done in the same time, mostly in the Hewson Hospital, and 30 urethral calculi have been removed. Perineal section, urethrotomy, and dilation of the urethra have been performed in 61 cases, and the bladder tapped through the rectum three times. Calculus in the bladder is fairly common in these States, especially in young boys of the poorer class, who are much exposed to cold and fed on millet. Litholapaxy is now performed in preference to lithotomy, unless the large size of the stone or the narrowness of the urethra contra-indicate it, in which case cutting is resorted to. Stricture is much rarer here than in the West, and its division from outside has been found to be the most satisfactory way of dealing with it, especially when it is hard or the urethra much constricted.

Operations on the Male Generative Organs.—Phimosis and paraphimosis are common, and circumcision, either for elongated prepuce or disease, is often required. The radical cure

of hydrocele is frequently needed. Amputation of the penis for cancer is occasionally required; hypospadias and extroversion of the bladder are rare. During the eight years' period 271 operations were performed on these organs as follows:—Tapping of hydrocele with iodine injection, 37, and without injection, 5; operations for phimosis, 69, and for paraphimosis, 14; amputation of penis for cancer, 15; reduction of protruded testes after injury, 1; scarification of scrotum and penis for œdema, associated with orchitis and balanitis (often caused by insect bite), 130.

Operations on the Female Generative Organs.—Only one ovariotomy has been performed by me, and that successfully. Ovarian disease is rarely met with, and the people are averse to undergoing serious operations, attended with risk, which can be put off without immediate danger.

Obstetric Operations.—These operations were as follows:—Delivery by forceps, 5; podalic version, 5; decapitation, 4; craniotomy, 2; and cæsarean section, 1. The local unqualified female practitioners have hitherto done most of this work, but some of it is now falling into the hands of the staff of the women's hospital at Jodhpore. Some of the local "Dais" are being trained in obstetrics.

Operations on the Breast.—The breast has been eighteen times removed in part or whole for malignant disease, and mammary abscess and fistula have been frequently treated by operation.

Operations on Bones and Joints.—During the eight years' period there have been 395 operations on bones, viz., setting compound and simple fractures, excision for caries and anchylosed joints, and removal of sequestra from different bones. There were 456 reductions of dislocations performed, as follows:—Lower jaw, 160; clavicle, 6; shoulder-joint, 133; elbow-joint, 33; hip-joint, 20; knee-joint, 9; patella, 3; thumb, 1; ankle-joint, 6; and metacarpus, 7. Guinea-worm

gives rise to many of the stiff joints seen, for so long as some of these people are able to get about, they are averse to operation.

Chloroform.—They dread the knife and anæsthetic very much, although there has not been a death from chloroform in these States, and only three patients have shown alarming symptoms. These three cases occurred on cold mornings, when the patients were depressed by a low temperature; and I believe the difference in temperature will account for the greater mortality from chloroform in cold countries when compared with hot. It is, therefore, of great moment to have the patient warm before chloroform is administered, and the operation room heated up to at least 75° F. Under a high temperature the patient's breathing soon becomes shallower and the chloroform expanded, consequently it is taken into the lungs slowly and in a diluted condition; it is then regularly distributed throughout the system, and produces quiet sleep and anæsthesia instead of poisonous narcosis.

Amputations.—During the eight years' period 195 amputations were performed (not including such amputations as those of the toes and fingers). The following are the causes which led to the operation:—Leg, for mycetoma, 92; thigh, for mycetoma, 5; hand, for mycetoma, 10; foot, for mycetoma, 21; total for mycetoma, 128; arm, for injuries, 12; for gangrene, 1; for caries, 5; for cancer, 1; at shoulder-joint, for injury, 1; forearm, for injuries, 10; for necrosis, 1; at elbow-joint, for injury, 1; thigh, for injuries, 4; for gangrene, 7; leg, for necrosis, 2; for injuries, 12; for gangrene, 3; through metatarsus, for injuries, 7.

It will be observed that amputation for mycetoma is frequent, notwithstanding the fact that the fungating tumour is often excised in the early stage before amputation is necessary.

Mycetoma is a disease of the sandy desert, common among

people connected with cattle. It usually begins in the foot, rarely in the hand. I have, however, seen a few of the hand cases among water-carriers, as if it required moisture to enable it to attack the skin. Its existence outside the human system is unknown. The fungus begins in the skin as a speck enclosed in a bag, which grows to the size of a walnut, and eventually bursts, discharging a thin watery pus. Other cysts containing the fungus form close to the parent, to which they are connected only by their thick fibrous walls. The limb attacked becomes thickened and enlarged, and the muscles, bones, and fibrous tissues invaded and softened by numbers of these cysts, filled with a cauliflower-like fungus, mostly black, sometimes pale pink. The whole limb eventually becomes implicated, and the skin perforated with numerous openings, from which the fungus and watery pus are discharged. It readily passes through joints, and when it attacks a long bone will run rapidly up the medullary cavity and soften the whole bone after a short time.

Operations on the Skin.—There were 4563 operations performed on the skin. Carbuncle is not infrequently seen and operated on. Skin-grafting is sometimes necessary after amputation of the breast, or in cases of large intractable ulcer.

Poisoning.—Opium-poisoning is occasionally seen, but the drug is in such common use that much of it can be taken without fatal results, and the people understand the use of some of the antidotes. Permanganate of potash has recently been tried as an antidote with success. Arsenic is the common poison used by criminals, and *dhatura* is usually administered by dacoits to enable them to plunder. Opium is given to most of the children of these States until they are over their early teething. The mothers have implicit faith in the drug, and accidents from excessive doses are not common.

The custom of giving opium to children is of very early date among these people; it was probably commenced to keep

them quiet while the mothers worked, and it does not seem to do them any harm, the habitues being generally well nourished and healthy in appearance. It is no doubt useful during the cutting of the early teeth. It is given up when the teething difficulties are over, and when the children can run about. Many of those accustomed to the drug in childhood never take to it again, except on great occasions, when hospitality is being dispensed, for which it is in general use.

Skin Affections.—Skin diseases are very commonly seen in this country, where water for washing and bathing is often scarce, and these affections are very varied in character and class. There were 96,000 cases treated in these States in eight years, of which 82,559 were in Marwar, 4802 in Sirohi, 7084 in Abu and Abu Road, and 1549 in Jaisalmir. The above figures only represent a small proportion of the ailments of this class throughout the States, as many of the people seek no relief from complaints which do not interfere with the daily round required to obtain their food.

General and Local Injuries.—These are not of common occurrence. There are no steam-factories, and the trains are not run with great rapidity or frequency; consequently collisions are unknown and railway accidents rare. Injuries from domestic or wild animals are occasionally seen. Children, and even adults, sometimes fall from upper storeys and into wells and sustain severe injuries, but such are not common, as the people of this country are cautious and easy-going. Carriages are not much in use, and they are not driven so fast as to cause frequent accidents. Accidents sometimes occur from powder and firearms, and at the Dewáli and Dassera festivals from fireworks and explosives. Free fights occasionally occur over border and other village disputes, when swords and sticks are used, sometimes resulting in serious injuries.

SICKNESS AND MORTALITY

In discussing the sickness and mortality of the different months of the year, the following tables have been used:—

(1.) Returns of patients treated in hospitals and dispensaries.

(2.) Mortality tables.

(3.) Meteorological tables.

Health of each Month.—As I have already shown, malarial fevers are the most common ailments of the people, and, although registration of vital statistics is of such recent date in these States that no satisfactory tables can be produced to prove this, it is well known that the death-rate from these fevers far exceeds that of any other disease, and that September, October, and November are the months of highest mortality as well as highest admissions to hospital. In the Jodhpore Central Jail, during the eight years' period 1890–97, thirty-six deaths occurred from malarial fevers, and twenty-one of these were in the three months mentioned, viz., September, October, and November.

January.—This month is the coldest of the year, and many of the poorer classes suffer much from insufficient clothing. In the Hewson Hospital (Jodhpore) returns, January stands seventh for admissions, and, in the table of vital statistics, fifth as regards mortality. It is sixth for rainfall, and there are generally showers some time during the month. It is, on the whole, a healthy month for those who are well fed and warmly clothed, but the poor suffer a good deal at this time from lung affections.

February.—This is the healthiest month, and stands twelfth in point of admissions, ninth in point of deaths, and tenth in point of rainfall; it only rained on two occasions in this month in twelve years. Lung and respiratory diseases are always less prevalent in this month.

March.—This month stands tenth for admissions, sixth for deaths, and twelfth for rain; slight showers occurred only on two occasions during this month in twelve years. This is generally a fairly healthy month, but the extremes of day and night temperature are very great, and colds and coughs are often prevalent; it stands highest for lung affections.

April.—This is a healthy month, although the temperature is generally high throughout. It stands eleventh for admissions, seventh for deaths, and eleventh for rainfall; two slight showers having been recorded in twelve years. There is little malarial fever in this month, but liver affections begin to be prevalent.

May.—This is always a very hot month; it stands ninth for admissions, tenth for deaths, and fifth for rainfall. Liver diseases are prevalent during this month, also dyspepsia, but malarial fevers are nearly at their lowest.

June.—This is generally the hottest month; it stands eighth for admissions, eleventh for deaths, and fourth for rainfall. Malarial fevers and dysentery are less prevalent during this month than at any other time of the year.

July.—This month stands sixth for admissions, twelfth for deaths, and second for rainfall. It is hot at the beginning, and the monsoon becomes general all over the country about the middle of the month. Malarial fever increases during this month, and diarrhœa is often prevalent.

August.—This month stands third for admissions, fourth for deaths, and it is the month of highest rainfall. It is generally cool and pleasant; but it is an unhealthy month throughout; malarial fevers then begin to be prevalent, and

there is more diarrhœa than at any other season of the year.

September.—This is also an unhealthy month. It is second for admissions, first for deaths, and third for rainfall. Malarial fevers are always prevalent, and there is much diarrhœa and a good deal of dysentery.

October.—This month is always unhealthy; it stands first for admissions, second for deaths, and seventh for rainfall. The day temperature rises, and the nights begin to get cool. It is the month of greatest prevalence of malarial fevers, and diseases of the respiratory system increase.

November.—The early part of this month is unhealthy; the days are then hot, the nights very cold, and the poor begin to suffer from want of warm clothing. It stands fourth for admissions, third for deaths, and eighth for rainfall. Malarial fevers become less prevalent, lung and respiratory diseases increase, and liver diseases, especially congestion, are common.

December.—This is a cold and healthy month, but the poor suffer considerably on account of want of warm clothes and fuel. It stands fifth for admissions, eighth for deaths, and ninth for rainfall, even occasional showers being rare during this month. There is always a marked fall in malarial fevers in this month, and the young improve greatly in health and vigour.

The western tracts of these States are subject to famines and frequent scarcities, which sometimes assist the spread of epidemic disease. When relief works are started, a hospital assistant, from a neighbouring dispensary or from the reserve list, is placed in medical charge of the people on the works. He attends to the sanitation of the camps, and also to the sick among the workpeople.

MEDICAL AID

Before the introduction of European methods of treatment, the practice of medicine in these States was principally in the hands of four classes of medical men, viz.—

I. Sádhs or Ascetics, who, by virtue of their great piety and abstinence, are believed to have obtained power over disease, and also over evil spirits, to which disease is often attributed in this part of India. These Sádhs or Ascetics use incantations, charms, and symbols. They impose restrictions of diet, as well as other strictures on pleasures and indulgences, and also many other rigid observances for the cure of disease. Besides, most of them claim a knowledge of occult remedies, principally vegetable products, but sometimes mineral, and even animal substances are prescribed by them. Many of these Sádhs seem to be careless of comforts and of worldly wealth, and to live up to their profession. There are not a few of them, however, who merely pretend rigid asceticism, and also practise much knavery for gain and admiration.

II. Baids or Hindu physicians are the ordinary medical practitioners of these States, and many of them still enjoy large practices. They generally inherit their profession, and ancient medical books are often passed down from generation to generation among this class.

III. Hakims or Mahomedan physicians are mostly of the Unáni school, and the profession generally passes down from father to son. Some of these Unáni Hakims have still a high reputation, especially those who have come from Delhi. Many of them travel about towns and villages to obtain a livelihood,

Jaswant Women's Hospital and Temple, Jodhpore.

To face page 254.

while others hold practices in large towns, or are salaried by the Darbars or wealthy citizens.

IV. Pansaris or Attárs are prescribing chemists who know the appearance and properties of drugs, and prescribe to assist their sales of medicine.

None of these practitioners are highly educated, and they know little of anatomy, and nothing of modern pathology. They often depend on the price of their drugs for fees, and consequently resort to deception in prescribing costly articles never compounded. They prescribe gold, silver, and pearls, and in this way extort money from their patients.

These Vaids and Hakims are said to be so jealous of their remedies that they often fail to disclose them to their sons and successors before they die. In this way many potent cures are supposed to have been lost.

Surgery has from ancient times been greatly in the hands of barbers, but Zurrahs or Mahomedan surgeons have had some practice in these States, and amputations were often performed by Rajput swordsmen, who could cut through a limb with one sweep. The stump of a limb so amputated was put into boiling oil to stop the hæmorrhage. This practice is now happily discontinued, but the barbers in remote places still open abscesses and set fractures in their own rude fashion, often with much detriment to the limb. The establishment of dispensaries has, however, done much to bring ignorant practitioners into disrepute. The barbers' setting of a fracture is now mostly looked upon as a temporary appliance to enable the patient to be conveyed in some comfort to the nearest dispensary, and many of the Hakims and Baids who held State appointments have disappeared before advancing medical science.

There are still practitioners of surgery and medicine who flourish to some extent in these States, viz., the Sojat Sáthias, who practise couching for cataract, as well as the treatment of

diseases in general. These Marwar Sáthias are Hindus of the Káyasth caste, and have a great reputation throughout Rajputana and many other parts of India. They travel about, prescribe, and operate for cataract in the streets and lanes. To perform the operation of couching with their very rough instruments, an incision is made through the cornea at the sclerotic margin, and a blunt hook introduced to depress the lens. The patient sees at once, pays his fee, and is bandaged up. The result is sometimes good, but in a large percentage of cases the lens either returns to the centre of the pupil and obstructs vision again, or produces inflammation which completely disorganises the eye. In these States the people are very conservative and adhere with great tenacity to their ancient institutions, and as the Sáthias have had some success, it has been difficult to supplant them. They are, however, yearly losing ground, and many people now resort to the hospitals for the cure of cataract, instead of intrusting themselves to the Sojat Sáthias. I performed 746 cataract operations during 1898, of which 96.34 per cent. were successful. It has, however, taken much time and trouble to get up a satisfactory eye department here, partly on account of the want of proper hospital accommodation and also on account of the conservativeness of the people, and their great faith in their ancient institutions. The following are some of the old remedies still in use in remote districts, and at one time general throughout these States.

Abscess.—(*a*) Seed of Rohira (*Tecoma undulata*) one chattack, with half a pao of "ata," sugar and root of "Bordi," all to be mixed and plastered on the abscess.

(*b*) To apply a red-hot iron on all sides of the abscess firmly.

(*c*) A plaster of ashes with water and honey given by a priest of Hanumanji—a charmed poultice.

Acidity.—(*a*) Ajma Umbel (*Carum carui*) two tolas, and salt one chattack; to be taken as powder with pure water.

Apoplexy.—(*a*) "Kalimirach" (*Piper nigrum*) two tolahs, "Malvi gul" (unrefined sugar) a pao, ghee half a pao; to be mixed and taken thrice daily.

(*b*) To apply a red-hot copper pice to the temple.

Asthma.—(*a*) Gum (*Acacia arabica*) and honey, one tolah each, juice of "Akra" (*Calotropis procera*) quarter of a tolah, and fine "Pili earth;" to be taken as pills thrice a day.

(*b*) Decoction of the seed of "Andijhara" (*Ficus virgata*) to be boiled in a seer of water and taken thrice daily; half a pao with three or four "Tulsi" (*Debregeasia bicolor*) or betel leaves.

(*c*) To apply the crust of a smoking "chillum" on both sides of the chest.

(*d*) To frequent holy places, as Bhahutā Sidh, and to wear a silver anklet in the name of that saint till the shrine can be visited.

Bite of Mad Dog.—(*a*) "Birami" (*Pueraria tuberosa*) root and "Saler" (*Boswellia thurifer*) root, a pao each, with a pao of well-powdered "Moth" (*Papilionacea motha*), to be taken as pills thrice daily.

(*b*) Red chillies (*Capsicum fastigiatum*) a pao, one tolah of camphor, and a pao sugar, to be mixed and taken thrice daily; one chattack of the mixture at a time.

(*c*) Cauterisation of the bitten part.

Bite of Snakes.—(*a*) Alum, ghee, onion, half pao each, with half a seer of pure milk, to be taken at once.

(*b*) Bhurat (*Cenchrus catharticus*), "Malwi tobacco" (*Nicotiana tabacum*), white "Jal seeds" (*Viburnum stellulatum*), and sugar-candy, a chattack of each, to be taken thrice daily.

(*c*) Wrapping the body in a cloth, and pouring cold water on it till the patient shivers. "Mesmerism" or "passes," and sucking the blood from the bitten part. Charms and munters.

(*d*) Pilgrimages to holy shrines as a prophylactic, such as the shrines of Ramdeoji, Mataji, Bhabuta Sidh; also applying ashes mixed with water from the sacred pot.

Catarrh, Colds, and Bronchitis.—(*a*) Leaves of "Nim" (*Melia indica*), thorn of "Babul" (*Acacia arabica*), a pao of each to be boiled in a seer of water till it becomes one pao, and taken with a pao of "Gul" (brown sugar) at once.

(*b*) Juice of "Akra" (*Calotropis procera*) half a pao, and oil of turpentine two pao; to be taken mixed, and also as an external application.

(*c*) Worship of Hanumanji and Pabuji.

Cholera.—(*a*) "Nim" (*Melia indica*) leaves, sugar-candy, ghee, half a pao each; asafœtida, camphor, "Lassan" (*Alium sativum*), half a tolah each; to be mixed well and taken as pills every two hours.

(*b*) Hot "chillum" to be applied over the abdomen.

(*c*) Worship at Ramdeoji, Mataji, Bhabuta Sidh, and at the same time to drink ashes with the sacred water.

Diarrhœa.—(*a*) Powdered bark of "Kair tree" (*Capparis aphylla*) half a pao, to be taken with curd and garlic (*Alium sativum*), one chattack each.

(*b*) To apply a hot "chillum" (coarse earthenware pipe) on the centre of the abdomen or "Navi" (navel).

(*c*) Visits to holy places, viz., Ramdeoji, Bhomiaji, Karniji, Mallinathji, &c.

Typhoid Fever (*acute Motijara nikala*).—(*a*) "Sanai" (*Senna indica*), sugar-candy, and "Dhana," a tolah each, to be taken at once; powdered ginger (*Amomum zingiber*), "Kalimirach" (*Piper nigrum*), cloves (*Caryophyllus aromaticus*), "Ajma" (*Carum carui*), "Hurr" (*Myrobalans*), and "Sambhar salt," one tolah of each, to be taken thrice daily; juice of "Gular" (*Ficus glomerata*), one chattack, to be mixed and taken twice.

(*b*) Blood of hare's liver, ten to twenty drops, to be taken with cotton-tree seeds (*Bombax malabaricum*), once daily; egg

of the "Batbur" (*Pterocles exustus*), one to be taken once a day, and house-flies till they produce vomiting.

(*c*) Worship, and drink sacred water with sacred ashes of Ramdeoji, Mataji, Pabuji, and Bhatianiji.

Fits.—(*a*) "Kalimirach" (*Piper nigrum*), one tolah well powdered, with half a pao of the juice of "Thor" (*Euphorbia royleana*), to be taken as snuff.

Convulsions.—(*a*) Opium (*Papaver somniferum*) fomentations.

Gravel.—(*a*) Worship of Ramdeoji only.

Gonorrhœa.—(*a*) Milk and water to be mixed in equal parts and taken.

(*b*) "Kewalia katha," "Elaychi chhoti," "Kapilo," "Sital mirach," "Ghora nisode," and alum, a tolah each, to be boiled in a seer of water and used as an injection.

"*Gujrati*" (*Pneumonia*).—(*a*) Juice of "Akra" (*Calotropis procera*), "Bar" (*Ficus indica*), "Kair" (*Capparis aphylla*), a tolah each, with some pieces of castor (*Ricinus communis*) or "Bar" (*Ficus indica*) leaves, to be taken thrice daily.

(*b*) Steel and powdered horn of "Sámber," a pao each, to be boiled 108 times, and when it becomes gelatinous it should be eaten.

(*c*) Worship of saints, such as Ramdeoji, Karniji, Bhatianiji, &c., &c.

Itch.—Sulphur, Til oil, gunpowder, curd, calves' urine, given both internally and applied locally.

Jaundice.—"Passes" (mesmerism), and frequent visits to Ramdeoji's shrine; also mercury in different forms.

Dysmenorrhœa.—(*a*) Three stalks of "Bajra," with half a tolah of the root of "Gurindá" (*Prinsepia utilis*), to be mixed and taken thrice daily.

(*b*) It is treated with the water in which the clothes of a pure man have been washed.

Leprosy.—(*a*) To worship the "Khejra" tree (*Prosopis spicigera*).

(*b*) Mercury, strychnia, phosphorus, and cantharides are frequently prescribed, often to excess, and generally with detriment to the patient.

JODHPORE.—There are the following hospitals and dispensaries at Jodhpore, viz.:—

Hewson Hospital.
Jaswant Hospital for Women.
Residency Hospital.
Jail Hospital.
Imperial Service Troops' Hospital.
First and Second Branch Dispensaries.

The Jodhpore Railway Dispensary, for the staff of the Jodhpore-Bikanir Railway.

There is also a Mission Hospital, supported by the Scotch Presbyterian Mission Society.

The Hewson Hospital has taken the place of the old main dispensary, which was the first dispensary established in Jodhpore; the latter was opened in 1853, and was merely an Hospital Assistants' house, with a couple of small rooms for the sick, and a small surgery. The former was opened in February 1888, and has been considerably added to since then, a new wing and an operation-room having just been completed. This hospital can now accommodate eighty in-patients, and there is an out-patient department attached to it. Part of the building is old, and was at one time a town-house; most of the old building is used for stores, compounding-room, office, and dispensary. Three double-storied blocks of buildings have been added from time to time since the adaptation of the building for hospital purposes, and the enclosure has been laid out as a garden and pleasure-ground. The hospital has been named after Mr. Hewson of the I.C.S., who was for some time lent by Government to the State as guardian of His Highness the Maharaja. The building is convenient for

the townspeople, as it is in the centre of the city; but it is otherwise for the Residency Surgeon, who has a ride of about six miles to and from his work there. In 1897 there were 411 in-patients and 17,351 out-patients treated, and 1277 operations performed, of which 141 were extractions of the lens for cataract, 15 litholapaxies, 15 lithotomies, and 5 radical hernias. In 1898, after the opening of the new wing above referred to, 719 in-patients were treated and 1657 operations performed, 692 of which were major; of the latter, 500 were extractions of the lens for cataract, 38 litholapaxies, 5 lithotomies, 2 radical hernias, and 1 ovariotomy.

The number of cases treated at this hospital during the twelve years 1886–97 is shown in the following table, together with the number of operations, major and minor, performed in the same period.

Table showing the Number of Cases Treated at the Hewson Hospital in the Twelve Years 1886–97, *together with the Number of Operations Performed in the same Period.*

Year.	Cases Treated.		Operations.	
	Out-Patients.	In-Patients.	Major.	Minor.
1886	6,658	95	61	375
1887	6,134	74	52	446
1888	7,132	151	77	469
1889	7,688	155	94	605
1890	7,911	133	86	748
1891	9,335	162	89	1,443
1892	14,810	168	86	871
1893	17,213	246	78	1,013
1894	16,335	313	79	1,009
1895	15,458	307	87	907
1896	16,655	402	253	998
1897	17,351	411	312	965
	142,680	2,617	1,354	9,849
Total	145,297		11,203	

The Jaswant Hospital for women was originally an old palace; it is situated in the centre of the city, and has been adapted for a "purdah" hospital; it can accommodate fifty in-patients, and there is an out-patient department. Miss Adams, M.D., is superintendent, and there is a qualified female hospital assistant in residence. This hospital was opened in November 1896, and has been named after the late Maharaja Jaswant Singh, G.C.S.I. During 1897, 6054 out- and 229 in-patients were treated, and 259 major and 368 minor operations performed.

The Residency Hospital is for the use of the Resident's staff and escort; it is in charge of an hospital assistant, who marches with the Resident, and it is supported by Government. The hospital assistant in charge, while on tour, is encouraged to treat villagers, and to make himself useful to the people of the neighbourhood when they require his services. During the year 1897 there were 2616 out-patients treated in this hospital, and 4 major and 44 minor operations performed.

The two branch dispensaries at Jodhpore are located at a considerable distance from each other and from the Hewson Hospital. Out-door patients principally attend these dispensaries, and they are a great convenience to those of the public who reside too far from the main hospital. The first branch dispensary is situated in a populous part of the town, in one of the principal markets. During 1897 there were 10,099 out-patients treated at this dispensary, and 800 minor operations performed in it.

The second branch dispensary is located outside one of the city gates, on a main thoroughfare, and it is very convenient for the workpeople, who pass in great numbers in that direction. In 1897 there were 146 indoor and 5829 outdoor patients treated at this dispensary, and 80 major and 831 minor operations performed.

There is a fine hospital for the Imperial Service Troops situated in the open plain, between the cavalry lines and the parade ground. It is in charge of an Assistant-Surgeon under the Residency Surgeon.

The Jodhpore Railway Dispensary was opened on the 23rd October 1896, and there were 2232 out-patients treated, and 87 operations performed in it in 1897.

The Mission Hospital in Jodhpore city was opened on 14th July 1885. During the year 1897, 7294 new cases were treated, 109 of which were indoor patients; 1477 operations were performed, of which 105 were major, and several of these were lithotomies. The Mission Surgeon and his assistants visit many people at their own houses in and about the city, and they sometimes go into the district, where they treat patients, the outwork being included with that done at headquarters.

Annexed is a table showing attendance at the various Jodhpore hospitals up to the year 1897.

Another table is also given to show cases treated, average daily attendance, and operations performed at the Marwar Dispensaries in the twelve years 1886–97.

TABLE I.—*Showing Attendance at the Jodhpore Hospitals up to the Year* 1897.

Hospital or Dispensary.	Number of Years.	In and Out Patients (New Cases).	Remarks.
Main Dispensary, now Hewson Hospital . .	24	216,022	.....
First Branch	24	169,475	.....
Second Branch	24	59,951	.....
Central Jail	24	16,325	.....
Jaswant Female Hospital	1 year and 1¼ months.	6,651	Opened on Nov. 24, 1896.
Residency Hospital . .	6	8,081	Records only from 1892.

TABLE II.—*Showing Cases Treated, Average Daily Attendance, and Operations Performed at the Marwar Dispensaries in the Twelve Years* 1886–97.

Years.	Number of Dispensaries.	Total Treated.	Average Daily Attendance.	Operations.	
				Major.	Total.
1886	6	23,257	289.32	83	1,784
1887	6	22,945	280.17	85	1,752
1888	10	33,898	382.12	157	2,630
1889	10	38,620	415.60	176	2,866
1890	11	42,585	481.27	221	3,139
1891	13	48,846	509.33	238	4,403
1892	13	66,072	559.82	211	3,890
1893	14	70,492	635.43	222	4,166
1894	15	71,939	731.61	192	4,373
1895	15	70,470	685.06	232	4,705
1896	17	84,093	814.82	612	5,975
1897	21	102,691	969.85	1,048	7,627
Total . .	...	675,908	6754.40	3,477	47,310

SIROHI.—The Sirohi dispensary was opened in the capital in February 1868, by an old Compounder who had long been employed in Abu. He was replaced by a qualified Hospital Assistant in 1883. In 1897, 187 in-patients and 5392 out-patients were treated, and 36 major and 433 minor operations performed in it.

The Crosthwaite Hospital has now been completed and opened, to take the place of the Sirohi dispensary, and give the increased accommodation which has been long needed for in-patients. It is situated in a suitable open space between the Palace and the Residency bungalow. It is well planned, substantially built, and well ventilated; it supplies to the people of Sirohi a long-felt want. It contains accommodation for twenty-four in-patients, and there is an out-patient depôt attached. It has been named after Sir R. Crosthwaite, K.C.S.I., late Agent to the Governor-General for Rajputana.

JAISALMIR.—There is only one dispensary in the whole State, and it is located at the capital. It was opened on the 13th April 1892, and a building has since been added, so there is now a good hospital in which much medical and surgical aid is given both to the people of the city and surrounding country. In 1897, 33 in-patients and 4618 out-patients were treated, and 25 major and 231 minor operations performed in it.

List of Government Medical Officers of the Jodhpore Political Agency and Residency.

Names of Officers.	From	To
Assist.-Surgeon W. J. Moore	May 6, 1862	September 5, 1862
Surgeon H. Eddowes (officiating) . .	December 26, 1862	February 21, 1863
Assist.-Surgeon W. J. Moore	February 22, 1862	July 10, 1867
Surgeon G. King	December 24, 1867	December 10, 1868
Assist.-Surgeon J. H. Newman . . .	April 14, 1869	August 27, 1871
Assist.-Surg. T. H. Hendley (officiating)	February 20, 1872	March 18, 1873
Assist.-Surgeon J. H. Newman . . .	March 19, 1873	March 15, 1877
Surgeon J. M. Brereton (officiating). .	October 19, 1877	March 15, 1878
Surgeon J. H. Newman	April 10, 1878	September 15, 1878
Surgeon-Major Spencer[1]	May 10, 1879	February 15, 1881
Surgeon A. Adams	April 10, 1881	October 29, 1893
Brigade-Surg. Lt.-Col. ffrench-Mullen .	November 30, 1893	March 28, 1895
Surgeon Lieut.-Colonel A. Adams . .	March 29, 1895	May 2, 1896
Surg. Lieut.-Col. P. A. Weir (officiating)	May 16, 1896	November 1, 1896
Lieut.-Colonel A. Adams, I.M.S.. . .	November 2, 1896	Present time

[1] Now Surgeon-General Spencer, C.B., P.M.O. Punjab Army, and Officiating Director-General, I.M.S.

VACCINATION

Marwar.—There is no record of vaccination in Marwar before 1867, when three vaccinators were employed, who in that year performed 5043 vaccinations, of which 2992 or 59.33 per cent. were successful. There was no change made in the number of vaccinators till 1870, when H.H. the Maharaja Takhat Singh consented to an increase in the staff to nine and to the appointment of an inspecting vaccinator, on the recommendation of Dr. Moore. In 1873 these vaccinators performed 5519 vaccinations, 51.68 per cent. of which were successful; a very small percentage of success, and indicative of apathy on the part of the vaccinators, as well as of obstruction from the people. H.H. the present Maharaja was vaccinated when a child, and this gave a great impetus to the work among the upper classes.

The vaccination staff was increased to eleven a few years later, and remained at that till 1885, when they were raised to 50 and regularly distributed over the country in circles set apart for each. During this year, vaccination made a good start; 40,457 operations were performed, 97 per cent. of which were successful, and some re-vaccinations were done.

The Thakars of Marwar were induced to keep their own vaccinators about this time, but the scheme did not work well, as the vaccinators were never paid until the Residency Surgeon made a visit of inspection to the Thakars' capital, when arrears were promptly liquidated. This system was abandoned on account of the difficulties it entailed in supervision and in obtaining regular payment of the staff. The

Thakars then agreed to contribute towards the maintenance of a staff of vaccinators according to their villages and lands, and a similar contribution was levied from other villages by the Darbar. In this way ample funds were provided for vaccination.

In 1889–90, the whole system was re-organised, and Marwar re-divided into circles for vaccination and supervision. A Deputy-Superintendent of vaccination was appointed under the Residency Surgeon, and under him six Assistant-Superintendents, to take charge of six vaccination districts into which the State had been divided for convenience of supervision. The vaccinators were increased to 84, to meet the further requirements of the State. A female Brahmin vaccinator was appointed to work among the close-purdah families, and to leave no objection possible on the part of the people against having the work carried out thoroughly. Sweeper-vaccinators were then appointed to work among the low castes, as people objected to sweepers being vaccinated by the ordinary staff. Brahmins were found the most successful vaccinators, as they could readily gain influence with the people; so preference was always given to this caste when vacancies occurred, and nearly all the vaccinators in Marwar are now Brahmins.

The female vaccinator has been found very useful, and she has been able to carry the work into the zenanas, where concealments would otherwise take place. Another female vaccinator has recently been employed to assist her, and they do much work which could not be done by the male staff. Vaccination is now general throughout the country, and it has already done much to mitigate the ravages of small-pox, which have hitherto been so frequent and fatal to young life. Moreover, most of the people have now come to recognise the great benefits conferred by vaccination, and there is hardly any opposition to it, even among the ignorant, except in a few Mina villages in wild districts. Many people call for regular attend-

ance of the vaccinators at their villages. At present the vaccination staff in Marwar consists of:—1 Deputy Superintendent, 7 Assistant Superintendents, 81 vaccinators, of whom two are female and two sweeper vaccinators. They are all under the Residency Surgeon, who superintends much of the work, and without whose supervision the department would readily lapse into disorder and abuse, and probably soon be a disadvantage rather than a benefit to the people. It is imperative to have as much European supervision of vaccination as possible, until the people have become thoroughly accustomed to it, and abuses must be carefully guarded against.

During the official year of 1897–98, 88,764 vaccinations were performed, of which 88,012 were successful, and of these 10,093 were verified by the Residency Surgeon.

The following are the tabular statements of vaccination seen and done in the State during the eleven years 1887–98:—

Statement (*No.* 1) *showing Vaccination Work Inspected by the Superintendent* (*Residency Surgeon*) *from* 1887 *up to the end of Season* 1898 (31*st March*).

Years.	No. of Villages Inspected.	Successful Cases.				Unsuccessful Cases Seen.	Total Seen.	Remarks.
		Three Good Marks.	Two Good Marks.	One Good Mark.	Total.			
1887 . .	159	2,112	2,894	385	5,391	161	5,552	From Jan. to Dec.
1888 . .	209	2,238	2,886	648	5,772	181	5,953	
1889 . .	101	1,049	1,586	236	2,871	75	2,946	Jan., Feb., and March only.
1889–90 .	192	3,561	2,700	555	6,816	192	7,008	From 1st April to 31st March.
1890–91 .	182	3,879	2,387	449	6,715	178	6,893	
1891–92 .	119	2,717	1,483	303	4,503	88	4,591	
1892–93 .	155	2,545	1,279	260	4,084	98	4,182	
1893–94 .	20	612	227	74	913	24	937	
1894–95 .	45	1,351	229	74	1,654	15	1,669	
1895–96 .	535	12,601	3,506	978	17,085	260	17,345	
1896–97 .	354	9,592	1,297	405	11,294	214	11,508	
1897–98 .	501	8,017	1,434	458	9,909	184	10,093	
Total .	2,572	50,274	21,908	4,825	77,007	1,670	78,677	

Statement (No. 2) showing Vaccination Work Inspected by the Native Superintendents (No. varying from 1 to 7) from 1887 up to the end of Season 1898 (31st March).

Years.	No. of Villages Inspected.	Successful Cases.				Unsuccessful Cases Seen.	Total Seen.	Remarks.
		Three Good Marks.	Two Good Marks.	One Good Mark.	Total.			
1887 .	449	4,640	6,847	662	12,149	355	12,504	From January to December.
1888 .	604	7,210	7,681	632	15,523	207	15,730	
1889 .	271	3,661	2,071	239	5,971	85	6,056	Jan., Feb., and March only.
1889–90	1,328	22,291	7,943	1,527	31,761	1,005	32,766	From 1st April to 31st March.
1890–91	2,577	43,100	12,882	3,168	59,150	1,464	60,614	
1891–92	2,637	38,846	11,365	2,115	52,326	1,375	53,701	
1892–93	2,206	27,370	8,510	1,911	37,791	1,489	39,280	
1893–94	2,669	32,339	9,429	2,228	43,996	1,256	45,252	
1894–95	2,241	30,034	7,407	1,651	39,092	933	40,025	
1895–96	2,976	39,585	6,021	1,470	47,076	714	47,790	
1896–97	2,552	39,822	5,394	1,370	46,586	657	47,243	
1897–98	3,601	48,352	6,942	1,820	57,114	1,239	58,353	
Total .	24,111	337,250	92,492	18,793	448,535	10,779	459,314	

Statement (No. 3) showing Total Number Vaccinated in Marwar from 1887 to the end of March 1898.

Year.	All Vaccinations.			Remarks.
	Male.	Female.	Total.	
1887	32,224	27,928	60,152	From January to December.
1888	28,698	26,063	54,761	
1889	16,340	14,567	30,907	January, February, and March only.
1889–90 . . .	42,557	37,963	80,520	From 1st April to 31st March.
1890–91 . . .	43,541	39,204	82,745	
1891–92 . . .	44,569	39,744	84,313	
1892–93 . . .	35,172	30,627	65,799	
1893–94 . . .	41,690	36,261	77,951	
1894–95 . . .	40,134	35,619	75,753	
1895–96 . . .	46,629	40,990	87,619	
1896–97 . . .	40,825	36,581	77,406	
1897–98 . . .	47,573	41,191	88,764	
Total . .	459,952	406,738	866,690	

It will be observed that during the eleven years under consideration the Residency Surgeon inspected 78,677 cases, and of these, 77,007 were at the time of inspection successful, or a percentage of 97.88 of successful cases. During the same period, 459,314 cases were inspected by the Native Superintendents, of which 97.65 per cent. were successful cases. The third table has been given to show the amount of work done by the vaccinators in the State during the same period. Of this total of 866,690 cases, rather more than a half has been inspected by the seven Native Superintendents, and less than an eleventh by the Residency Surgeon.

The cost of vaccination, for the above period, has been as nearly as possible 2 annas and 2.53 pies.

The following tables of small-pox mortality in the Jodhpore, Sirohi, and Jaisalmir cities, for the four years 1894–97, previous to which records are not available, are given :—

Small-Pox Mortality, 1894–97, *Jodhpore City.*

Months.	1894.	1895.	1896.	1897.	Four Years.	Mean.	Order of Month in Mortality.
January . . .	...	...	...	...	...	...	...
February . . .	...	...	1	...	1	0.25	6
March	1	...	10	2	13	3.25	3
April	...	...	26	5	31	7.75	2
May	...	..	39	3	42	10.50	1
June	...	...	12	...	12	3.00	4
July	...	...	...	2	2	0.50	5
August	...	...	...	...	...	...	...
September . . .	...	...	...	...	...	...	...
October	...	...	...	...	..	...	...
November . . .	...	...	...	...	...	...	...
December . . .	...	...	...	...	...	...	...
Total . . .	1	...	88	12	101	25.25	...

Registration of births and deaths in the Jodhpore State has only recently been commenced, so the mortality of Jodhpore city for a few years only has been given. However, it is well known that the thorough vaccination now established throughout the State has done much to mitigate the ravages of small-pox.

Sirohi.—One vaccinator has been employed in the Sirohi State for about eighteen years, and a second for ten years. There has also been a vaccinator at Mount Abu, attached to the charitable dispensary there, during the last seventeen years. The Sirohi vaccinators have recently been increased to four, and the State divided into five vaccination circles, one of which is worked by the Abu vaccinator. This will ensure regular work and facilitate the inspections, which have mostly to be done by the Residency Surgeon, Western Rajputana States. Vaccination in and around Abu is also regularly superintended by him, and the work is more advanced in the hill villages than below, as the staff set apart for the duty in Sirohi has not till very recently been able to carry it out thoroughly on account of the size and difficulty of the country. Much vaccination is now, however, being done, and the juvenile population will soon be as well protected as in Marwar.

The following are tabular statements of vaccination seen and done in the State from 1887 to 1897–98:—

Statement (*No.* 1) *showing Vaccination Work inspected by the Superintendent* (*Residency Surgeon*) *from* 1887 *up to the end of Season* 1898 (31*st March*).

Years.	No. of Villages Inspected.	Successful Cases.				Unsuccessful Cases Seen.	Total Seen.	Remarks.
		Three Good Marks.	Two Good Marks.	One Good Mark.	Total.			
1887 . . .	6	51	20	3	74	5	79	From Jan. to Dec.
1888 . . .	10	158	61	13	232	8	240	
1889 . . .	10	267	101	35	403	7	410	Jan., Feb., and March only.
1889–90 . .	8	139	77	18	234	10	244	
1890–91 . .	11	266	120	30	416	7	423	From 1st April to 31st March.
1891–92 . .	5	154	62	22	238	5	243	
1892–93 . .	9	139	100	28	267	10	277	
1893–94 . .	1	39	23	4	66	2	68	
1894–95[1] .	...	...	...	...	...	...	...	
1895–96 . .	25	600	182	36	818	17	835	
1896–97 . .	14	498	158	28	684	13	697	
1897–98 . .	32	1,201	484	122	1,807	24	1,831	
Total . .	131	3,512	1,388	339	5,239	108	5,347	

[1] No inspection was made.

The above table shows that, during the ten years of inspection, the Residency Surgeon inspected 5347 cases, of which 108 were found unsuccessful, or 97.98 per cent. successful cases.

The other table is attached to show the amount of work done by the vaccinators in the State.

Table Showing Total Number Vaccinated in Sirohi State from 1887 *to the end of March* 1898.

Year.	All Vaccinations.		
	Male.	Female.	Total.
1887	1,304	1,030	2,334
1888	2,311	1,963	4,274
1889	1,029	831	1,860
1889–90	1,623	1,355	2,978
1890–91	2,004	1,826	3,830
1891–92	2,263	1,883	4,146
1892–93	2,089	1,726	3,815
1893–94	2,154	1,776	3,930
1894–95	2,094	1,775	3,869
1895–96	2,293	1,931	4,224
1896–97	2,250	1,901	4,151
1897–98	1,812	1,602	3,414
Total . . .	23,226	19,599	42,825

The cost per vaccination for the above period, taken together, has been as nearly as possible 1 anna and 5.14 pies.

Small-Pox Mortality, 1894–97, *Sirohi City.*

Months.	1894.	1895.	1896.	1897.	Four Years.	Mean	Order of Month in Mortality.
January	...	...	...	2	2	0.50	2
February . . .	...	...	...	13	13	3.25	1
March	...	...	...	2	2	0.50	3
April	...	...	...	1	1	0.25	5
May	...	...	1	...	1	0.25	6
June	...	...	...	...	...	...	...
July	...	...	...	...	...	...	...
August	...	...	...	...	...	...	...
September . . .	...	...	...	...	...	...	...
October	...	...	...	...	...	...	...
November . . .	...	...	...	...	...	...	...
December . . .	...	...	2	...	2	0.50	4
Total . . .	...	...	3	18	21	5.25	...

JAISALMIR.—Vaccination was commenced in Jaisalmir in 1890, and the children of the capital, as well as in some of the towns, are now well protected. It will, however, take much time to make it general in a country of over 16,000 square miles in area, with a semi-nomadic population, and little money to spare for such a purpose.

Four vaccinators are now employed, under the Hospital Assistant as superintendent, and the Residency Surgeon, Western Rajputana States, supervises much of the work on the way to and from Jaisalmir city, when he makes his annual visit to that capital.

The following are tabular statements of vaccination seen and done in the State from the year 1890–91 to 1897–98.

The first table shows that, during the seven years of inspection, the Residency Surgeon inspected 1597 cases, of which 28 were found unsuccessful, or 98.25 per cent. successful cases.

The second table is given to show the amount of work done by the vaccinators in the State.

Statement (*No.* 1) *showing Vaccination Work Inspected by the Superintendent* (*Residency Surgeon*) *from* 1890–91 *up to the end of Season* 1898 (31*st March*).

Year.	No. of Villages Inspected.	Successful Cases.				Unsuccessful Cases Seen.	Total Seen.	Remarks.
		Three Good Marks.	Two Good Marks.	One Good Mark.	Total.			
1890–91 .	2	52	8	7	67	1	68	From 1st April to 31st March.
1891–92 .	1	26	22	6	54	1	55	
1892–93 .	3	15	12	4	31	4	35	
1893–94 [1] .	...	...	...	...	...	...	...	
1894–95 .	1	45	3	1	49	1	50	
1895–96 .	9	245	69	17	331	6	337	
1896–97 .	12	171	30	9	210	4	214	
1897–98 .	18	644	150	33	827	11	838	
Total .	46	1,198	294	77	1,569	28	1,597	

[1] No inspection was made.

Statement showing Total Number Vaccinated in Jaisalmir State from 1890–91 *to the end of March* 1898.

Year.	All Vaccinations.		
	Male.	Female.	Total.
1890–91	88	87	175
1891–92 . . .	125	123	248
1892–93	353	301	654
1893–94	958	864	1,822
1894–95	1,775	1,443	3,218
1895–96	1,372	1,048	2,420
1896–97	671	528	1,199
1897–98	990	767	1,757
Total . . .	6,332	5,161	11,493

The cost per vaccination for the above period, taken together, has been as nearly as possible 2 annas and 2.08 pies.

Small-Pox Mortality, 1894–97, *Jaisalmir City.*

Months.	1894.	1895.	1896.	1897.	Four Years.	Mean.	Order of Month in Mortality.
January	...	...	...	. .	...	...	...
February . . .	4	...	1	...	5	1.25	3
March	1	...	...	...	1	0.25	5
April	...	...	30	...	30	7.50	1
May	1	..	12	...	13	3.25	2
June	.	...	1	...	1	0.25	6
July	...	...	2	...	2	0.50	4
August	...	. .	...	...	...	...	...
September . .	...	...	...	...	..	...	...
October . . .	...	...	...	...	. .	...	...
November . .	...	...	...	...	...	...	...
December . . .	...	...	...	...	...	...	...
Total . . .	6	...	46	...	52	13.00	...

General Remarks on Vaccination.

Arm-to-arm vaccination has been greatly practised in these States, but buffalo lymph is now supplanting the old method, and the people like it better, as many of them have a strong objection to giving lymph from their children to others. They think the taking away of lymph weakens the protection, and saps the strength of the infant to an injurious degree, and it sometimes makes the child cry, which appeals to parents and works against it.

Arm-to-arm vaccination is, in my experience, when carefully done, rarely followed by bad results. Specific disease is not readily communicated through lymph, and can never be communicated in this way when proper care is exercised. It gives a stronger vesicle and a better mark than buffalo lymph, especially when the latter is preserved in glycerine, and it still remains to be demonstrated that glycerine calf lymph affords equal protection from small-pox.

The vaccination season commences at the end of September and ends at the beginning of April, as the hot weather and rains are not well suited for the work. In the hot months it is difficult to keep the lymph in the very dry, high temperature which prevails, and, in the rains, ulceration at the seat of vaccination often occurs; besides, flies irritate the children, and often carry the lymph to other parts of the body, and produce ulcers and inflammation wherever there is an abrasion. Lymph is kept up in some cool place during the hot weather and rains, so as to be available for the early season, but no attempt is made to push vaccination further at these times, on account of the unsatisfactory results above mentioned,

Re-vaccination has not been much practised in these States, as the people are more opposed to it than to the primary protection. They have been long accustomed to

inoculation, which no one would think of repeating, so they are unable to realise that a second vaccination could be called for, and it will take a long time to get them over this prejudice.

Inspection of vaccination is carried out as much as possible during the cold season by both the Residency Surgeon and the other inspectors, and the people have quite got over the objection of showing their children when asked to, as most of them now recognise the good effects that vaccination has had on small-pox epidemics.

SANITATION

JODHPORE.—A Conservancy system for Jodhpore city was attempted in 1875 under two Darogás, but it was not a success. It was again reorganised in 1882. However, the Residency head-quarters were then at Erinpura, and little was done till 1884, when an advance was made and a Municipal Committee appointed by Colonel Sir Pratap Singh, with the Residency Surgeon as President, to look after the public health and the cleaning of the city, to settle disputes, to prevent encroachments on the public streets and thoroughfares, and transact other municipal business. A Municipal Secretary was appointed, a grant of Rs. 1500 per mensem placed at the disposal of the Municipal Committee, and a staff of sweepers engaged; rubbish carts were purchased, and latrines for males and females, as an experiment, erected. The system worked well, and was steadily extended. In 1885 carts for the conveyance of rubbish and filth were in daily use, and the city was then described as "now fairly clean."

The Committee made the following bye-laws during the same year:—

1. Respectable citizens to carry lights and go unmolested at night.

2. Camels carrying stones for building purposes to be allowed to enter the city from 11 A.M. to 3 P.M.

3. Shopkeepers to erect iron shades instead of the grass *chhappars*, as now in use, in front of their shops.

4. Dundnees to have permission to remove the urine from their houses at night according to custom, provided they do

not create a nuisance or cause inconvenience in the neighbourhood.

5. Adulterated sugar found in the possession of confectioners and traders to be confiscated and the owners fined.

6. Large slabs and stones not to be allowed to remain on the public roads, and all building materials to be removed as soon as the buildings or repairs have been completed.

7. Halwais having fires outside their shops to be compelled to remove the ashes, or to pay the Committee for having this done.

By the end of the next year, six sets of latrines on an extensive scale had been opened. These were well kept and much appreciated by the people. The night-soil was regularly removed to fields some two miles away from the city, on both its east and west sides, and there trenched into the soil. Ten more latrines were opened in 1887, and the ten conservancy carts then in use reinforced by twenty more. In 1888 the sets of latrines rose to eighteen, and were used by all classes except Srimali Brahmins. In 1889 their number was raised to twenty; and in this year the proposal to have a light railway for the more complete removal of refuse was taken into consideration. By the end of 1890 two new sets of latrines had been added to those already in use in the city; the Fort had been cleaned, and its drainage put into a better sanitary condition. Ten new municipal carts were purchased, and the staff of sweepers made up to the present strength. The light railway has recently been completed; it is working very satisfactorily, and has done away with the difficulty, so long experienced, of obtaining buffalo carriage. It also allows of the night-soil and debris of the city being carried well beyond city limits. The Jodhpore cultivators will not make any use of night-soil, as they say it burns up the crops in this dry climate. The problem of its disposal has therefore been rendered somewhat difficult. It is proposed to use incinerators

to consume the rubbish, as soon as they can be provided, and this will effect a considerable saving in carriage.

The Conservancy staff is now regularly paid, and the Municipal Committee, consisting of a secretary and twenty-three influential members, presided over by the Residency Surgeon, with the City Kotwal as vice-president, take considerable interest in sanitation. Consequently the progress, made during recent years in this direction, has been marked and steady.

For purposes of conservancy, the city and suburbs are divided into four circles, and these into two subdivisions each. There are one Daroga, three Jamadárs, twenty-four sweepers, and three buffaloes set apart for each circle. In addition to this, a special staff is also kept up for the palace, bungalows of officials, and other houses outside municipal limits; and there is a gang of sweepers and Beldárs employed under a Daroga and Jamadár on the trenching grounds, which are about five miles from the city. Four Jamadárs are employed specially to look after the private or "Birat" sweepers, and to punish them for any neglect or infringement of municipal rules.

The principal bazaars and suburbs are daily cleaned by municipal sweepers; the lanes, enclosures, and private latrines by "Birat" sweepers. The city sweepings are removed by both municipal and "Birat" sweepers to the nearest public latrines, and loaded into waggons to be taken off to the trenching grounds. Some of the sweepers use buffalo-carriage, others carry the refuse in baskets, as the streets are in many places too narrow for carts.

There are at present thirteen double sets of public latrines for males and females within municipal limits, with a total of 701 seats for males and 658 for females. Srimali Brahmins still hold that it is contrary to their religious views to use latrines; so a place has been set apart by the Committee to

which they generally resort for purposes of nature, and the ground is regularly cleaned.

Notwithstanding the latrine accommodation provided in convenient localities throughout the city and suburbs, some of the people, especially the Pushkarna Brahmins, are still averse to using them. A careful watch has therefore to be kept over such people, to prevent the infringement of municipal rules.

The excreta from the public latrines is removed to the tramway collecting station in closed-up waggons drawn by buffaloes, and thence conveyed to the trenching ground by a steam-engine, when a train has been made up from these and the "Birat" sweepers' collections.

The "Birat" arrangement is not so perfect nor so satisfactory as it ought to be; but any other would be attended with great expense, which could not be borne by municipal funds. These "Birat" sweepers are paid very little in money for their labours by the owners or occupiers of houses. They mostly get refuse food from their masters. Some of the well-to-do, however, pay a monthly salary and give old clothes in addition. At certain seasons all sweepers receive small money allowances.

The tramway runs round the city walls in two directions, and emerges from it on the south side. A short distance from the city wall, through which it passes, there is a changing station in an open space where the trains are made up. Buffalo draft is used up to this station, as it would endanger the safety of the people to take the engines inside the city. The trains are made up at the changing station twice a day, and taken off to a distance of nearly five miles, where the refuse is burnt and the night-soil trenched into the ground. On the return of the trains the waggons are taken back by buffaloes to sidings near the public latrines to be refilled. The waggons are taken out from the latrines in the early morning and late

at night, so as not to disturb the citizens. On account of the scarcity of water for irrigation, and the prejudices of the people, no advantage has yet been taken of the trenching grounds for crops.

In order to prevent rabies, the Municipality take charge of stray dogs, which are fed by the townspeople at a place without the city, where they are confined and the sexes separated.

The grant of Rs.1500 per mensem has recently been increased by the Darbar to Rs.2000, to meet the increasing sanitary requirements of the city of Jodhpore.

The following are the chief items of expenditure:—

	Rs.
1. Head office and Municipal Secretary . .	140
2. General cleanings	577
3. Public latrines	242
4. Tramway and trenching grounds . . .	317
5. Preservation of city tanks	40
6. Suburbs	309
7. Conservancy workshop	50
8. English coal	50
9. Repairing public latrines and making pans .	200
10. Miscellaneous items	75
Total . .	2000

There is a Darbar grant of Rs.100 per mensem given for the sanitation of Pali, an important town forty miles from Jodhpore on the Jodhpore-Bikanir Railway; and this, augmented by subscriptions from the people, keeps up a staff of sweepers, carts, and animals for the conservancy of the town. Some of the well-to-do in other large towns in Marwar contribute towards the sanitation of their towns, but village sanitation is mostly backward. However, in most places greater attention is now being given to the protection of drinking-water, and to many other sanitary precautions than hitherto; and

it is hoped that the spread of education among the people will have a good effect in this direction.

The vaccination staff is trained in elementary sanitation, to advise the villagers (among whom their ordinary work lies) in the protection of the water supply, the prevention of epidemics, and other matters connected with public health. The Residency Surgeon travels a good deal in the district, and points out to the officials and headmen sanitary defects which can be remedied.

Sanitation in SIROHI and JAISALMIR is still in a very primitive state. Most of the people resort to the jungle for purposes of nature, and there is no well-organised sanitary staff, although cleaning-up is done in both capitals. The house-latrines are regularly cleaned by "Birat" sweepers, and the streets receive some attention on special occasions. However, the burst of the monsoon is too often relied upon to thoroughly clean the streets and lanes. In 1891–92 steps were taken to improve the sanitary arrangements at Sheoganj, on account of the proximity of the Erinpura cantonment, and this town is now fairly clean. The sanitary arrangements of Mount Abu and Abu Road are under well-organised departments, already referred to.

Palace and Chattris.

To face page 283.

DISPENSARY TOWNS IN STATES

JODHPORE STATE.

Pali.

Pali, the commercial capital of Marwar, is situated forty miles south-east of Jodhpore, on the main road between Ahmedabad and Ajmere; it has long been the chief commercial mart of Western Rajputana. The principal trade carried on is that of dyeing woollen, silk, and cotton cloths. Cloth-stamping is carried on, and there is considerable work in ivory. The town is built of burnt bricks, no stone being readily procurable in the neighbourhood. It now contains about 20,000 inhabitants, but it had a much greater population at one time, and silk-dyeing was then largely carried on. It has acquired an unenviable notoriety as the place of origin of the rat-fever or Indian plague of 1836 (*vide* "Note on Plague").

In the civil wars that formerly raged in Marwar, the possession of Pali, from the commercial character of its inhabitants, was of great importance, and at the desire of the trading classes a fortification was raised, which still exists, although in places broken down. As an emporium its reputation is of an ancient date, and politically it is connected with the establishment of the reigning family of Marwar. A community of Brahmins at one time held Pali in grant from the princes of Mandore, whence comes a numerous class termed Palliwal Brahmins, most of whom follow mercantile pursuits. It was at the beginning of the thirteenth century that Siaji, the founder of the Rathore dynasty, and son to the Raja of Kanauj,

passed Pali on his return to Dwarka from a pilgrimage to the Ganges. The Brahmins sent a deputation to ask him to relieve them from two great enemies to their repose, namely, the Minas of the Aravallis and the lions, which were then very numerous. Siaji relieved them from both, but the opportunity to acquire land was too good to be lost, and on the festival of Holi he put the leading Brahmins to death and took possession of Pali.

The climate is fairly good; the water supply good and abundant. Many of the people are very well-to-do, but malarial fevers are somewhat more prevalent than in the dry and sandy parts of Marwar.

The Pali Dispensary was opened in February 1865. In 1897, 21 in-patients and 7363 out-patients were treated, and 447 operations performed in it.

Jasole.

Jasole is a town of about 4000 inhabitants, situated on the Luni river, two miles from Balotra Railway Station. Most of its people are engaged in agriculture. The town is naturally well drained, as part of it is located on the slope of a hill; the subsoil is hard, and the water supply is good and abundant. Kher, the ancient capital of Mallani, was situated a short distance from the site now occupied by Jasole, and there are ruins of another once important town adjacent, viz., Nagar. Jasole rose as these towns decayed, and it now contains the descendants of some of the earliest Rathore settlers in this country. Rao Asthánji conquered this part of Mallani shortly after the Rathores settled at Pali, and occupied Kher and the adjacent country. Tilwara, where the great Mallani fair is annually held, is about ten miles from Jasole, up the Luni river. This fair lasts a fortnight, and great sales of bullocks, camels, and horses are effected at it. The water of

the Luni is believed by many to become sweet during the time of the fair, for the convenience of the large gathering of people which takes place there to do honour to the memory of Mallinath, as well as for purposes of business and pleasure. The fair is held at the end of March, and then the bed of the Luni is dry, except in a few places where there are brackish pools. Abundance of good water can, however, be obtained at this season, by digging holes in the bed of the river at Tilwara, and during the fair each party has its own well within its camp—a very unusual convenience in Marwar; consequently the legend of the sweetening of the water. Epidemic disease very rarely breaks out at this fair, both on account of the good and abundant supply of water, and of the dryness of the surrounding country at the season when the fair is held.

The Jasole Dispensary was opened in 1870; there were 69 in-patients and 4839 out-patients treated in it in 1897, and 289 operations performed. Every year, during the time the Mallani fair is being held, a branch dispensary from Jasole is opened in Tilwara for the convenience of the people there assembled.

Nagore.

Nagore, situated on the Jodhpore-Bikanir Railway, about ninety miles due north of Jodhpore, is a large, walled, irregularly built city, formerly the capital of the northern portion of Marwar, and still containing the fort and palace of the former rulers. At least one quarter of the city is now in ruins, presenting a confused mass of fallen houses and of debris, such as one might expect to encounter in some city of the dead, but scarcely to be seen in a town containing some 20,000 inhabitants. There are several handsomely carved sandstone houses, generally the property of merchants engaged in amassing wealth elsewhere.

Various sanguinary encounters have taken place at Nagore. Rao Chonda successfully attacked the Imperial garrison then located there, in the latter part of the fourteenth century. Again, in 1407 A.D., Rao Lakhman of Jaisalmir pretended to offer a daughter in marriage to Chonda, and went so far as to say, if he suspected aught unfair (there had long been a feud between the two families), he would, though contrary to custom and his own dignity, send the Bhati princess to Nagore. The offer was accepted, and the wedding-party set out; but the carriages supposed to convey the bride's *cortège* contained armed men. Chonda having come out to meet (as he thought) his bride, found out his mistake and commenced to retreat, but too late. The secreted men rushed out from their carriages, and Chonda was killed at the gate of Nagore. In A.D. 1561 Nagore was captured by Akbar, but was afterwards restored by him to the Rathores for services rendered by the chief.

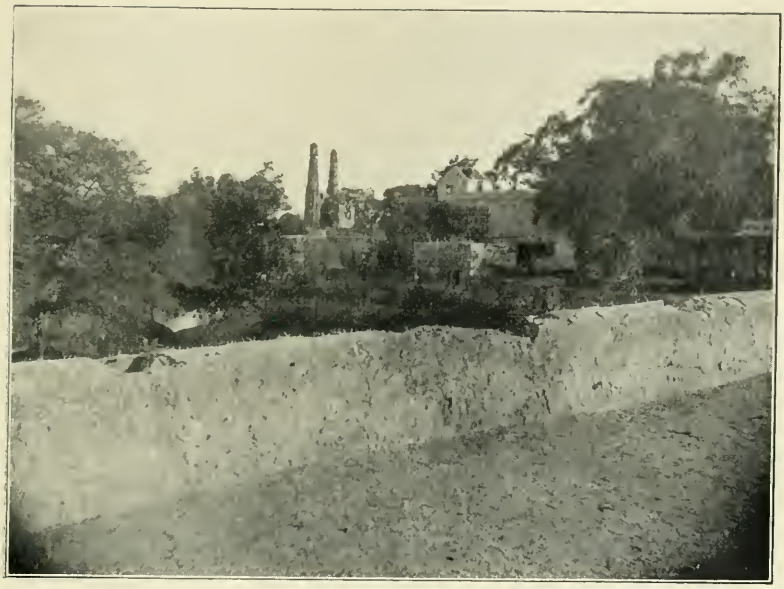
The manufacture of iron and brass pots and pans, locks, agricultural implements, camel-saddles, and many articles in domestic use, is still carried on in Nagore. There is a brisk export trade in these things.

There is a good and fairly abundant water supply adjacent to the town. The climate is considered good, although the extremes of temperature are very great, the heat being intense in summer and frost common in winter.

A dispensary was established at Nagore in July 1874; there were 80 in-patients and 5650 out-patients treated in it, and 305 operations performed in 1897.

Didwana.

The town of Didwana is the head-quarters of the Hakim of that district, and a great salt manufacturing centre. It is situated 140 miles north-east of Jodhpore, adjacent to a large



Mosque, Nagore.

Dispensary, Temples, and Mosque, Merta. *To face page* 286.

salt lake, and is a large walled town, said to contain about 12,000 inhabitants. There are no manufactures of importance except salt, which is largely produced for export, and the people depend greatly on this industry for their livelihood, supplemented by agriculture. The town is surrounded by a substantial stone wall, and the houses are well built of stone and lime. There are several good wells of sweet water without the walls, and on the south-west side of the town, opposite the salt lake, there is a small fresh-water tank, which lasts eight or nine months of the year. The town has fairly good natural drainage; it is healthy, and comparatively free from malarial fever.

The town dispensary of Didwana was established on the 1st of January 1884; 3 in-patients and 1608 out-patients were treated, and 73 operations performed in it in 1897. There has been a N.I.S.R. Department Dispensary at the salt settlement since April 1878, and the Hospital Assistant in charge works the town dispensary as a branch, his other duties being very light. This dispensary is of great advantage to the villagers of this remote district, and it is worked at little cost to the Marwar Darbar.

Merta.

Merta, a walled town of about 8000 inhabitants, is the capital of Eastern Marwar. It was founded by Rao Dooda, fourth son of Rao Jodha, and added to by Rao Maldeo, who reigned from A.D. 1532 to A.D. 1569, and built the fort, called, after him, "Mal Kot." Merta has been the scene of many a hard fight, and the country around is covered with stone pillars erected to the memory of the gallant who fell in battle. It was at Dangarwas, about two miles distant, that, in A.D. 1790, the Mahrattas, under De Boigne, fought the Rathores. The great battle took place on the bund of a tank called Dangolai, and there is still to be seen a tomb erected to the

memory of a Frenchman, a captain of infantry, wounded in the service of Maharaja Scindia on the 11th September 1790, who died of his wounds on the 18th of the same month, aged sixty-one. The inscription is in French, on a white marble slab, still in a good state of preservation. Water is plentiful at Merta, there being numerous tanks all round the city, and wells are in abundance for irrigating gardens and fields. Merta was at one time a great trade centre, and there are still many fine stone carved houses, now vacant, although in good preservation, which were formerly occupied by merchants whose descendants have settled in Ajmere. The climate is somewhat malarious and unhealthy at certain seasons, especially after the monsoon. The soil is rich and very productive, and the population, now considerably reduced, are mostly engaged in agriculture. Country cloths, blankets, woollen mats, earthenware toys and vessels are the principal manufactures. There are a handsome mosque and some fine temples in the town; the fort is still well preserved.

The Merta dispensary was established on the 1st of January 1888. In 1897, 57 in-patients and 6859 out-patients were treated, and 328 operations performed in it.

There is another dispensary at Merta Road (an important junction on the Jodhpore-Bikanir Railway) for railway employés. It was opened on the 1st of January 1897, in which year there were 1220 out-patients treated and 66 operations performed. The site of this settlement is very free from malaria and healthy, there being an abundant supply of good well-water available throughout the year.

Pohkaran.

The fort of this important town, the capital of the chief Thakar of Marwar, is said to have been constructed by Rao Maldeo, out of materials brought from Satelmir, an old town about two miles from Pohkaran, which he dismantled.

Satelmir was built by Satal, the eldest son of Ráo Jodhá (after whom Jodhpore is named), on the top of a low ridge of hills. There is nothing left of the town now, except the ruins of an old Jain temple and a few old walls. Pohkaran is the chief town of the appanage of the premier baron or Thakar of Jodhpore, who holds the post of Pardhán to H.H. the Maharaja, which entitles him to hold the "morchhal" or peacock "chhaori" and to a seat in the "khawáss" or behind the Maharaja on an elephant on all state occasions. All documents, being grants of lands, villages, and substantial rank, granted by the Darbar, require the signature of this Thakar before they become absolute. His ancestors came from Bhinmál to Pohkaran in the time of Maharaja Abhai Singh. The present Thakar of Pohkaran was educated at the Mayo College, Ajmere. He is the only Thakar in Marwar who keeps up a dispensary, and his administration is advanced. The town is healthy; the water supply good and abundant; the population is about 10,000, a large proportion of whom is engaged in cultivation.

The present Thakar of Pohkaran opened his dispensary on the 1st of January 1888; there were 4384 out-patients treated in it in 1897, and 327 operations performed.

Jalore.

Jalore, the chief town of the Southern Parganas of the Jodhpore State, is situated on the southern border of the vast sandy plain of Marwar, which stretches away for full 300 miles—broken only occasionally by low ranges of rocky hills—to the Indus on the west and the Satlaj on the north. It is a place of importance, famous in former ages for the strength of its fort and the many long and gallant sieges it withstood, defying the Mogul and other invaders. It was built early in the Christian era by the Pramárá dynasty, then all-powerful

in Western India. Its walls, composed of huge masses of cut stone strongly cemented together by pure lime, remain in perfect preservation. The fort is about 800 yards in length and 400 in width. It crowns a rocky hill of an altitude of 1200 feet above the surrounding plain, and commands the town, which hugs the northern slope of the hill, on which the fort stands out in great magnificence. The main entrance of the fort lies on the town face of the hill, and leads up a steep slippery stone roadway, passing three distinct lines of defence, all of considerable strength, and having mounted guns directed from the outer face of the fort. A single rampart wall, about 20 feet in height, capable of supporting artillery, protects the fort on the side away from the entrance. This fort is amply supplied with sweet water from two excellent tanks within its walls.

Jalore is eighty miles south of Jodhpore, on the banks of a small river, the Sokri. The original name of the town was Jallundar, and it was once the capital of the Chohan Rajas. The town, like the fort, is well supplied with water, and being situated on the slope of the hill, it is well drained except at one corner, below which it is damp and malarious. The population is about 10,000, engaged chiefly in agriculture and export of grain seeds, cotton, and wool. There are no manufactures of importance, but country cloth, camel-saddles, some iron implements and domestic utensils are made in the town.

The Jalore dispensary was opened on the 1st of January 1888. In 1897, 106 in-patients and 3160 out-patients were treated, and 308 operations performed in it. Vesical calculus is a common ailment in the district, which in other respects is generally healthy, and fairly free from malarial fevers, except after the monsoon season.

Bilara.

Bilara, a walled town, is situated about forty-five miles east of Jodhpore city, near Banganga river. It is the headquarters of the district, and also of the Dewan Sahib, the spiritual head of the Sirvi community. Here he has his palace and some of his gods, and the magnificence of his court, as well as the money he brings to the town, adds greatly to its importance. There are several depressions adjacent to Bilara, and there was formerly considerable trade in salt in this town; but the manufacture has been stopped, so the 13,000 inhabitants are now mostly engaged in ordinary trade and agriculture. The soil is productive and water plentiful in the district, which produces wheat, cotton, and seeds in abundance. The Luni river has had a dam thrown across it (by Mr. Home) where it passes through low hills about four miles from Bilara, and this has produced one of the finest artificial lakes in Rajputana. The town of Bilara is low-lying and at times water-logged. There is much irrigation about, and in consequence malarial fevers and spleen diseases are common; but the people are well fed and prosperous, which enables them to withstand the malarial influences.

The Bilara dispensary was opened in March 1890; there were 78 in-patients and 4056 out-patients treated, and 270 operations performed in it in 1897.

Nawa.

Nawa, the capital of the district and headquarters of the Hakim, is a walled town situated on the Sambhar lake, 140 miles north-east of Jodhpore. It is intimately connected with the salt trade of Sambhar, and has a population of 5126, many of whom are traders and bankers. The town is badly drained, and at certain seasons of the year outlying portions of it are flooded

with brackish water from the salt lake. There are some good wells in and about the town, and it is on the whole fairly healthy, probably owing to the salubrious breezes from Sambhar salt lake, There are no manufactures of any importance carried on in this town, and most of the people depend on the saltworks for a livelihood. This town has had a railway station for a long time, for the export of salt, which is large, and the Jodhpore-Bikanir Railway joins the Rajputana-Malwa Railway outside the town.

A dispensary was opened at Nawa in 1891; there were 47 in-patients and 4791 out-patients treated in it in 1897, and 246 operations were performed.

Jaswantpura.

Jaswantpura (formerly Lohiana) is a small town at the foot of the Lohiana hill, a detached portion of the Aravallis, west of Mount Abu, and rising to a height of nearly 4000 feet above sea-level. The site of the town is rocky and fairly drained, but the adjacent ravines and parts of the hill are densely wooded. There is a good and abundant water supply from wells fed by a small stream adjacent. Nevertheless the inhabitants, numbering about 4000, suffer a good deal from malarial fevers and spleen diseases, on account of the proximity of the town to the hill. Anæmia and malarial jaundice are not uncommon. The houses are mostly substantially built of bricks with tiled roofs, and as the town is new, it has wide streets regularly laid out, and better ventilation than some of the older villages. The old town was destroyed a few years ago on account of the predatory habits of the Thakar and his Bhil following. The new town built in its stead is situated a little farther away from the hill, to render escape from it difficult. The people of the district are principally a wild variety of Rajputs and hill Bhils. They have only lately taken

to agriculture, and would still prefer to live by brigandage, as they have done for generations.

They are a hardy race, fond of strong drink and drugs, and have no great need of a dispensary. This is, however, useful to the many settlers who have been attracted to the place since the establishment of law and order, and to the large police force quartered there in their interests.

A dispensary was established in the town in November 1891; there were 39 in-patients and 3183 out-patients treated, and 256 operations performed in it in 1897.

Balmer.

Balmer, the present capital of Mallani and the head-quarters of the Hakim of the district, was founded by Bara Rao in the thirteenth century. It is a substantially built town on the side of a rocky hill, about sixty miles from Jasole, on the Pachbhadra-Umarkote Railway; it contains about 6000 souls, is well drained on account of its position on the hill, and very healthy. The Rathores, long settled here, are so prolific that some of the best families have divided and sub-divided their lands till many of the descendants of Mallinath now hold ancestral estates of little more than "three acres and a cow." The Bálmer Rajputs are of fine physique and features, and are good horsemen. They are little given to excess in wine and opium, and they live a great deal in the open air, which has no doubt helped to keep them well grown and healthy.

There are no manufactures of any importance carried on in Mallani. Cattle and horse breeding is the most profitable industry, except on the banks of the Luni river, where wheat is grown in abundance.

A dispensary was opened on the 23rd of May 1893; there were 12 in-patients and 2529 out-patients treated, and 190 operations performed in it in 1897.

The ruins of an ancient fort crown a hill above the town, which was of use as a refuge long ago.

Phalodi.

Phalodi, the headquarters of the Hakim of the district, is a large and flourishing town of about 12,000 inhabitants, situated eighty miles north and a little east of Jodhpore. This town at one time belonged to Jaisalmir, and afterwards to Bikanir, before it came into the hands of the Marwar Raj. It has a good water supply, is well drained and very healthy. Most of the houses are substantially built of stone and mortar, and some of them have beautifully carved sandstone fronts. There is a fort of considerable strength, with well preserved battlements, in the centre of the town. It was built by Rao Hamira Nirawat, great-grandson of Rao Suja. There is a house still in the fort called by Hamira's name. The fort was added to by Rao Maldeo, who succeeded to the *gaddi* of Marwar in A.D. 1532, and it is now in good order, having been recently repaired. Many of the Banias of this town are very enterprising, and trade beyond the borders of India, bringing back much wealth to the town. Most of the women and children of Phalodi are unusually fair and good-looking. They dress well, and present a prosperous appearance.

There is a salt marsh eight miles from Phalodi, where large quantities of salt were formerly manufactured and exported; but the export trade has been discontinued, and little salt is now collected.

There are no manufactures of importance carried on in this town, only a little work in camels' hair, wool, leather, and metal vessels.

A dispensary was opened in Phalodi in September 1894, and before this there was a salt dispensary at the saltworks.

In 1897 there were 24 in-patients and 4431 out-patients treated, and 395 operations performed in the town dispensary.

Bali.

Bali, a walled town, the capital of the Bali district in Godwar, is the headquarters of the Hakim, and is situated about eighty miles south-east of Jodhpore, near the Aravalli range of hills; its population is about 6000. The district is very fertile, and many of the inhabitants are engaged in the cotton and grain trades. The town is fairly drained; it has a good water supply, and is healthy. The houses are mostly substantial brick buildings with tiled roofs, and the people are generally well-to-do. There are fine temples, beautifully carved, at the foot of the Aravalli range, not far from the town, to which many pilgrims resort. They are dedicated to Rampuri, and are almost unrivalled in carved figures.

A dispensary was established in this town in March 1896. It has been well attended during the short time it has been opened, and promises to be of great service, both to the people of the town and the surrounding country.

In 1897, 17 in-patients and 4166 out-patients were treated, and 318 operations performed in it.

Bhatki.

Bhatki is a very small village near the Rann of Kutch, on the south-western border of Marwar; the district is marshy and very malarious in many parts, as the Luni river overruns the country at this place during the monsoon. There are many salt marshes here, and formerly salt was exported from this part of the country; but this is now prohibited, and there is a salt revenue post here to prevent the manufacture of the article for export.

A dispensary was opened at Bhatki for the use of the district in February 1897, and there has been a salt dispensary for the use of the people of the N.I.S.R. Department

there for a long time. One hospital assistant takes charge of both, and gets a small local allowance from the Marwar Darbar in addition to his Government pay for medical charge of the salt department.

In 1897 there were 160 in-patients and 397 out-patients treated, and 53 operations performed in the district dispensary. The population is too sparse to give a large attendance at the dispensary.

Sojat.

Sojat is a walled town of about 13,000 inhabitants, forty-five miles south-east of Jodhpore, and six miles from the Rajputana-Malwa Railway Station, known as Sojat Road. The surrounding country is productive, and there is considerable trade in the town, which is healthy and naturally well drained. The houses are of stone and mortar, substantially built and well roofed. The handicrafts are the manufacture of saddles, swords, daggers, knives, scissors, and razors; there is also trade in cotton, wool, grain, and drugs. The town is very old, and was once depopulated; it suffered severely from plague in 1836, when it was infected by hundreds of refugees from Pali after the outbreak of the Pali plague there.

A dispensary was opened in this town in September 1897, and many people have already taken advantage of this, although the Sojat Baids, Hakims, and couchers are far famed for their great success in the healing art. These couchers travel all over Rajputana, Central India, Kathiawar, Sindh, and other parts, to perform operations for cataract, with instruments of the rudest manufacture. They operate in the lanes and streets under most adverse circumstances; still they have some success in couching, although they destroy numbers of eyes which might be saved under antiseptic precautions. Many of the people have absolute faith in their skill, and pay them considerable fees for performing operations which they

could have properly done free of charge at the dispensaries; such is the force of habit and the disinclination to change among the people of this country. In 1897, 5 in-patients and 986 out-patients were treated, and 43 operations performed in the dispensary.

Shergarh.

Shergarh was long held in *jajiri* by Deorajot Rajputs, but it is now *khalsa*, and the headquarters of a Hakim. Its original name was Serra, called after a well sunk by Seroori, a maid-servant of one of these Rajputs.

Shergarh is situated forty-six miles north-west of Jodhpore; it contains 275 houses, of which 40 belong to Mahajans and 150 to cultivators, principally Rajputs.

There is a good well in the town, which is worked by bullocks; it is about 150 feet deep.

The soil is dry and sandy, and sandhills, known as "tibas," surround the town.

There are two temples in the town, one of which has only recently been built, and the new dispensary recently opened is the most imposing feature of the place, as most of the people live in huts.

Desuri.

Desuri is a walled town situated about sixteen miles to the east of Bali in Godwar, at the foot of a hill of the same name. It was at a very early period in the possession of Baorecha Chohán̈s, who were expelled by Solankhi Rajputs. The latter ultimately became the Jagirdars of the Rana of Meywar, and the ancient buildings, some of which still exist, are said to have been erected by these Solankhi Rajputs. This village was confiscated and made *khalsa* in Sambat, 1927 (A.D. 1871), previous to which it was held by the Thakar of Rupnagar. It is now the headquarters of a small

Hakumat which was lately established there, owing to the predatory habits of the Minas of the surrounding country.

Its population is about 4000, consisting chiefly of Mahajans, Sirvis, Srimali Brahmins, Bhils, and Minas, mostly cultivators.

The soil is rich clay, but it is hard and requires copious rains; the well-water is sweet.

The natural drainage of this town is fairly good and the people are generally healthy.

A small river passes the town and feeds a number of wells used for irrigation.

Desuri was the favourite Shikargah of the late Maharaja. It has a small fortress on a hill above the town, a garden, and a bungalow, sometimes occupied in the shooting season.

A dispensary is shortly to be opened there.

BRITISH INSTITUTIONS IN MARWAR STATE.

Western Rajputana States Residency Hospital.

It is the oldest institution, having been established in 1840. (For further particulars *vide* "Hospitals and Dispensaries at Jodhpore.")

N.I.S.R. Pachbhadra Dispensary.

Pachbhadra is a flourishing town on the Jodhpore-Bikanir Railway, about sixty miles south-west of Jodhpore city. Its population is about 8000, and there is considerable trade carried on in it on account of its proximity to the salt tract. A dispensary was opened at the salt station in January 1879, for the use of the officials and employés there, and arrangements have since been made to allow the hospital assistant in charge to treat any villagers who apply for medical aid. In 1897 there were 1434 out-patients and 67 in-patients treated,

and 79 operations performed in it. There is a Government observatory at this station, in charge of the hospital assistant. It is one of the hottest stations in India. The fresh-water supply fails nearly every summer, and water has then to be carried by trains from a distance of ten or twelve miles.

N.I.S.R. Bhatki Dispensary.

The salt dispensary at Bhatki was opened on the 1st of April 1891. There were 55 indoor and 269 outdoor patients treated, and 7 operations performed in it in 1897. (For further particulars *vide* "Dispensary Towns in Marwar State.")

N.I.S.R. Didwana Dispensary.

The Didwana salt dispensary was opened on the 1st of April 1878. There were 41 indoor and 582 outdoor patients treated, and 23 operations performed in it in 1897. (For further particulars *vide* "Dispensary Towns in Marwar State.")

SIROHI.

Sheoganj.—Sheoganj (besides the capital) is the only dispensary town of the Sirohi State, and it is situated outside the Erinpura cantonments. It was founded by Sheo Singh in 1854, and has a population of about 5000. There is considerable trade in this town on account of its proximity to Erinpura cantonment. The natural drainage of the town is fairly good, and there is a good and abundant supply of well-water. The houses are mostly brick built with tiled roofs; the principal streets are wide, with rows of well-grown nim (*Melia indica*) trees running from end to end; but there is no architectural beauty in the town, the houses being mostly only substantial brick buildings of the plainest design.

A dispensary was opened in Sheoganj in 1893, in such a house as could be obtained; but a new dispensary building has now been completed which will give good accommodation for in-patients, and an improved out-patient department is also attached. In 1897, 1903 out-patients were treated and 82 operations performed. Most of the important operations are performed in Erinpura cantonment by the medical officer and subordinates of the Erinpura Irregular Force.

JAILS

JODHPORE.—Before 1874, prisoners at Jodhpore were exceedingly badly accommodated. The jail was a part of the Kotwali, situated in the centre of the city, the space allowed to each prisoner being about enough to allow him to lie down. Little light or fresh air found admission into the reeking yard, in which generally over 300 men were huddled together, and there was no arrangement for washing, cooking, or conservancy. In fact, nothing more dreadful could be conceived, and the whole was an opprobrium to the State. In 1874 all this was completely remedied. The Political Agent brought the matter to the notice of His Highness the Maharaja, who at once agreed to the construction of a new prison, the necessity for which he saw. A large octagonal building, which had been erected for stables, was chosen, standing some 1000 yards outside the Sojat gate of the city. By running up partition-walls from the angles of the octagon to meet a central ring, wards were obtained, and a central tower and passage were constructed at the junction. Of the eight wards, seven were occupied, the other was fitted with a gate and porch for the entrance to the prison. Each division consisted of a large open yard with a series of deep sheds or roofed-in arcades in which the prisoners slept; these dormitories were 118 feet long by 18½ feet wide, and 9¾ feet high. Cook-houses and latrines were provided in the enclosures, and, later, a supply of water was procured from a well sunk outside the jail walls for drinking and washing purposes. In 1884 the refuse water from the jail was utilised for a garden at a short distance from the

prison, and from which some country vegetables were obtained for the prisoners. Bathing platforms were built in each enclosure a short time afterwards, and the night-chain, which was run through the top ring of the fetters of each prisoner, tying the entire population of each dormitory together, was abolished in 1887. This was a marked advance in jail management, and it was followed by the formation of a hospital and a separate ward for female prisoners. An experienced Daroga from Allahabad jail was retained, as the next step forward, to introduce discipline and industries amongst the convicts, who were now fed on regular rations at the expense of the Darbar, and some of whom were at first employed in making a new road round the city. Medical aid was afforded from the Second Branch Dispensary; 457 jail patients were treated in the first year, the mortality being 65 per *mille*, which was an improvement on previous years. This adapted jail was in use as the State prison for about fifteen years, when it became so overcrowded and unhealthy that it had to be abandoned, and a new one built on modern hygienic principles, which now affords greater and better accommodation. By 1892 barracks for a large new jail had been constructed, but several subsidiary buildings were still required before they could be occupied. There had been overcrowding throughout the year in the old jail; the death-rate was 62.46 per 1000. Dysentery, diarrhœa, and lung diseases were so prevalent that it was imperative to get the prisoners out of it as soon as possible. The new jail was taken into occupation in March 1894, and the health of the prisoners soon showed improvement. It was described then by a local authority as one of the finest jails in Rajputana, well situated, well constructed, and able to accommodate 1000 prisoners. The hospital was at that time still outside the main prison wall, but it is now included. Pipe water from Balsamand reservoir was laid on to all sections of the jail, and an improved jail garden

was started. The result of the transfer to this jail, as well as of the improved water supply, was a material improvement in the health of the prisoners; the death-rate fell from 43.35 in 1893 to 30.04 per *mille* in 1894. The provision of accommodation for prisoners appeared to be ample when the jail was built. The jail population has, however, been rapidly increasing; in 1894 it averaged 765.57 per diem; in 1895 it rose from 794.70 in January to 849.22 in December, averaging 814.10 for the year; and in 1896 the average daily strength in the first quarter was 858.38; in the second, 934.04, and for the third quarter, 1013.44. Additional accommodation was then asked for to provide (1) a ward for under-trial prisoners; (2) a ward for female prisoners, with an hospital attached; (3) cook-rooms; and (4) store-rooms. In the meantime, the excessive population of the new jail was accommodated in the old jail. In 1897, the Jubilee, the birthday of the Queen Empress, and the birthday of His Highness the Maharaja had all been taken advantage of to reduce the jail population. Still it continues to be excessive, and more accommodation must now be provided.

The Mallani prisoners were confined in a jail at Jasole till 1895, when, on the recommendation of the Residency Surgeon, they were removed to the new jail at Jodhpore. This jail was badly planned, ill-ventilated, and incapable of accommodating more than half the prisoners usually confined in it. So its abolition has been an undoubted advantage to the prisoners of that district.

A table is given showing average strength of prisoners, admissions into hospital, deaths, &c., for the thirteen years 1885–97.

Statement of Strength, Admissions into Hospital, Deaths, &c., in Jodhpore Jail, from 1885–97.

Years.	Average Strength.	Admissions into Hospital.	Admissions per *Mille* of Strength.	Average Daily Sick.	Deaths.	Deaths per *Mille* of Strength.	Remarks.
1885 . .	463.32	667	1439.61	20.04	16	34.53	...
1886 . .	467.53	713	1525.03	21.07	7	14.97	...
1887 . .	533.07	791	1483.85	24.48	13	24.38	...
1888 . .	593.91	773	1301.54	20.93	7	11.78	...
1889 . .	708.00	695	981.63	16.70	19	26.83	...
1890 . .	743.75	670	900.84	15.17	18	24.20	...
1891 . .	839.63	1035	1232.69	20.87	35	41.69	...
1892 . .	880.55	1032	1171.99	23.27	55	62.46	12 cholera.
1893 . .	830.36	1068	1286.19	22.87	36	43.35	...
1894 . .	765.57	746	974.44	21.29	23	30.04	...
1895 . .	814.10	268	329.20	14.21	36	44.22	...
1896 . .	957.32	464	484.70	14.54	25	26.11	...
1897 . .	923.97	539	583.35	15.36	10	10.82	...
Total .	9521.08	9461	13695.06	250.80	300	395.38	...
Average	732.39	727.77	1053.47	19.29	23.08	30.41	...

Carpets, darries, paper, blankets, towels, and cane chairs are made in the jail, and the Marwar printing-press and ice machine are worked by prisoners.

The insanes, formerly confined in the jail, are now treated in a lunatic asylum set apart for themselves, and this is an advance of much importance.

Sirohi.—The Sirohi jail is a new building, constructed on modern hygienic principles, and capable of accommodating 300 prisoners. It is located on a healthy site, well away from the town. It is well supplied with water, and has a good vegetable garden attached.

A table is given showing average strength of prisoners, admissions into hospital, deaths, &c., for the thirteen years 1885–97.

The Sirohi prisoners were formerly confined in an old and ill-ventilated stable under the fort, so the new jail is a marked improvement.

Statement of Strength, Admissions into Hospital, Deaths, &c., in Sirohi Jail, from 1885–97.

Years.	Average Strength.	Admissions into Hospital.	Admissions per *Mille* of Strength.	Average Daily Sick.	Deaths.	Deaths per *Mille* of Strength.	Remarks.
1885 . .	47.55	143	3007.36	6.49	...	...	...
1886 . .	61.99	192	3097.27	8.92	4	64.52	
1887 . .	63.62	190	2966.48	7.42	...	...	...
1888 . .	68.81	167	2426.97	6.81	...	...	...
1889 . .	77.68	283	3643.15	12.39	3	38.61	...
1890 . .	92.02	356	3868.72	17.94	4	43.46	...
1891 . .	93.36	294	3149.10	11.61	1	10.71	...
1892 . .	117.32	213	1815.55	8.61	4	34.09	...
1893 . .	127.50	137	1074.51	6.37	3	23.53	...
1894 . .	131.15	154	1174.23	8.40	6	45.75	...
1895 . .	124.57	155	1244.28	9.08	8	64.22	...
1896 . .	133.43	126	944.32	8.10	8	59.96	...
1897 . .	102.55	83	809.36	4.85	...	...	...
Total .	1241.55	2493	29221.30	116.99	41	384.85	...
Average	95.50	191.77	2247.79	9.00	3.15	29.60	...

Jaisalmir.—All the prisoners of the State are confined at the capital. The building occupied by the prisoners was not originally built for a prison, but it has been adapted from time to time, and is now fairly comfortable, well ventilated, and well kept. It is in the form of a quadrangle, with the dormitories along two sides; there is a considerable open space between them and the fort wall, which forms another boundary. It is a great improvement on the cells in the basement of the fort which were formerly set apart for criminals.

A table is given showing average strength of prisoners, admissions into hospital, deaths, &c., for the four years 1894–97.

The insanes have been removed from this jail, and a lunatic asylum provided outside, which affords superior accommodation for these helpless creatures.

Statement of Strength, Admissions into Hospital, Deaths, &c., in Jaisalmir Jail, from 1894–97.

Years.	Average Strength.	Admissions into Hospital.	Admissions per *Mille* of Strength.	Average Daily Sick.	Deaths.	Deaths per *Mille* of Strength.	Remarks.
1894 . .	46.33	156	3367.15	7.40	...	...	...
1895 . .	32.94	195	5919.85	6.16	...	...	...
1896 . .	46.11	205	4445.89	8.08	3	65.06	...
1897 . .	41.11	59	1435.17	3.38	...	...	...
Total .	166.49	615	15168.06	25.02	3	65.06	...
Average	41.62	153.75	3792.01	6.25	0.75	16.26	...

INSANES

JODHPORE.—The amount of insanity in Marwar is small; insanes, according to the census of 1891, numbering only 836 (534 males and 302 females), or .0003 of the entire population. Female lunatics are 36.12 per cent. of all lunatics in Marwar. The number of insanes in Parganas ranged from 1 in 870 in Bilara Pargana to 1 in 24,000 in the Jodhpore Pargana. By castes insanes were found as follows:—

		Males.	Females.
Játs	85	49	36
Mahajans	83	52	31
Brahmins	78	50	28
Rajputs	76	55	21
Mussulmans	67	45	22
Kumbars	49	33	16
Sádhs	25	20	5
Bhils	25	17	8
Chákars	31	18	13
Chárans	16	9	7
Other castes	301	186	115

The census disclosed no insanity among Gujars, Chhipas, and Khátis. The forms of insanity most frequently met with appear to be mania, melancholia, and dementia. Idiocy does not very frequently present itself. The predisposing causes of insanity are said to be mainly drugs and sexual excess, and probably also financial difficulties.

As regards treatment, insanity being looked upon by the upper classes as detrimental to the family name and matrimonial prospects, their insanes are often kept quite secluded,

and, when necessary, under restraint; but, on the whole, they are kindly treated. Among the lower classes the insanes are found chiefly amongst beggars, mendicants, and Sádhus, addicted to drugs, particularly hemp. If not a public nuisance, such persons are left alone to subsist on the charity of their friends or of the public, and are not ill treated; but if they prove a nuisance, they are placed under restraint, and detained in quarters specially prepared for them in the old jail building. Part of this building has recently been changed, and adapted for a lunatic asylum, with male and female warders appointed to administer to the wants of the inmates. The expenses of these lunatics are defrayed by the State, and they are made as comfortable as possible.

Sirohi.—There are but few insanes in Sirohi State, and for financial reasons dangerous lunatics have hitherto been confined in a separate compartment in the jail. A new lunatic asylum, with accommodation for male and female insanes, is now about to be built, and the jail will cease to be used for them. Harmless insanes are generally taken charge of by their relations, but some are allowed to go about and depend on the charity of the people; they are mostly kindly treated.

The insanes, according to the census of 1891, number only 85 (50 males and 35 females), or .0004 of the entire population.

By castes insanes were found as follows:—

	Males.	Females.
Mali	1	...
Thakar	4	...
Mina	...	2
Grasia	1	...
Brahmin	1	...
Charan	2	...
Bhát	1	...
Mahajan	10	5
Sonar	3	2

	Males.	Females.
Lohar	2	1
Kháti	2	...
Darzi	...	2
Rabari . . .	...	2
Teli	3	2
Kumbar	5	4
Chamar	1	2
Siláwat	2	...
Unspecified	12	13
Total . .	50	35

JAISALMIR.—There are few insanes in this State, and they are generally taken charge of by their relations, or allowed to beg about the bazaars. A new building, with accommodation for both males and females, has now been completed, and insanes found wandering about the streets will, in future, be confined in it, and humanely treated. Insanes, according to the census of 1891, numbered only 44 in the whole State, (33 males and 11 females), or .0004 of the entire population. By castes insanes were found as follows :—

	Males.	Females.
Rajputs	6	2
Brahmins	4	...
Mahajans	2	2
Unspecified	21	7
Total . .	33	11

METEOROLOGY

THERE are three meteorological observatories in these States, viz., one at Mount Abu, one at Pachbhadra, and one at Jodhpore. The two former are maintained by the Government of India, the latter by the Jodhpore Durbar.

The observatory at Jodhpore was established on the 10th October 1896, and since that time regular observations have been recorded. It is situated in an open plain, 788 feet above sea-level, and is connected with the Jaswant College.

The wind blows almost persistently from north-east from the month of November to February, but is variable during the months of March and April; while a regular south-west wind prevails, as a rule, from May to October. Most violent hot winds blow in the months of May and June. Dust and thunderstorms are frequent during May, June, and July. The highest wind velocity in the year 1897 in twenty-four hours was 296.8, while the lowest was 20.7 miles in the same time.

The barometric pressure, since the establishment of the observatory, has ranged between 29.546 inches and 28.776 inches.

The hottest period is from the middle of May to the middle of June, and the coldest month is January.

In 1897 rain fell in the months of June, July, August, September, and October, giving a total of 15.64 inches of rain for the year; while in 1898 it rained in the months of June, July, September, and December, giving only a total of 9.15 inches. The country is very subject to a capricious rainfall.

All the Parganas of Marwar are now supplied with rain-gauges, and returns regularly submitted to the Secretariat Office of the Musahib Ala.

In Jaisalmir State there are also rain-gauges in some Parganas, but the returns appear to have been very carelessly kept.

Weather records are kept at Erinpura, which is adjacent to Sirohi, and the rainfall recorded there may be taken for the Sirohi State.

The following tables show daily readings of the maximum and minimum dry thermometers and the dry and wet bulbs from 10th October 1896 to 30th November 1898 at Jodhpore. Daily readings of the solar and grass radiation thermometers from 14th October 1896 to the end of the year 1898 at Jodhpore. Daily readings of the barometric pressure from 10th October 1896 to 30th November 1898 at Jodhpore.

Seven tables showing the amount of rainfall registered in twenty-three Parganas of Marwar for the years 1891–97, and a table showing rainfall of Jodhpore city for the twelve years 1887–98.

Five tables showing the amount of rainfall registered in three Parganas of Jaisalmir for the years 1895–97, and two Parganas for 1894–97—the only records available.

Statements showing rainfall, barometer, mean temperature, and wind direction for the ten years 1889–98 at Mount Abu.

A statement showing mean temperature and rainfall for the ten years 1888–97 at Erinpura.

Statements showing rainfall of Sirohi and Jaisalmir cities for the seven years 1891–97.

Statement showing the Maximum and Minimum Temperature

Date.	Oct. 1896.		Nov. 1896.		Dec. 1896.		Jan. 1897.		Feb. 1897.		March 1897.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	...	...	92.4	65.6	79.5	52.9	70.3	46.9	79.6	52.8	84.4	57.5
2	...	...	93.1	66.0	80.8	47.5	71.2	47.2	75.9	53.4	84.9	57.5
3	...	...	91.4	60.0	82.9	48.7	72.9	49.5	77.7	51.3	81.7	56.2
4	...	...	91.4	59.1	83.4	54.6	73.2	51.7	76.0	54.0	88.8	63.2
5	...	...	93.8	59.8	83.1	53.4	74.8	50.1	76.9	55.9	92.0	57.0
6	...	...	97.3	59.9	83.9	56.0	81.7	47.4	81.1	50.4	88.9	56.4
7	...	...	98.1	64.2	83.1	55.9	81.9	55.7	82.0	58.0	93.8	56.7
8	...	...	96.0	69.5	83.5	57.3	81.0	58.7	76.9	54.0	91.4	62.5
9	...	...	94.7	68.0	85.8	48.9	85.9	54.3	80.3	56.2	90.0	62.8
10	99.0	70.9	95.7	70.3	85.2	49.2	86.9	52.0	79.9	56.5	84.1	54.2
11	98.3	64.4	96.8	68.5	85.9	49.0	87.8	58.4	81.7	48.4	82.8	51.0
12	98.3	65.0	97.0	69.5	79.9	50.4	79.7	47.6	80.5	45.1	83.5	49.0
13	99.3	68.9	97.1	67.9	80.8	49.1	77.7	48.8	74.5	49.4	84.9	53.1
14	100.9	61.5	93.2	69.3	79.1	53.1	76.9	53.5	76.1	52.0	92.7	57.3
15	99.9	61.5	93.2	65.0	78.9	48.9	60.6	34.5	78.0	52.7	96.9	61.0
16	100.4	65.5	90.9	62.6	82.8	48.5	62.6	39.1	79.8	48.2	97.8	60.1
17	98.5	66.8	90.9	64.0	80.5	47.8	59.9	38.5	81.7	46.3	96.9	65.9
18	98.9	66.7	90.8	64.6	79.0	49.6	64.4	46.5	80.0	56.2	94.7	64.0
19	97.9	63.9	91.9	65.6	79.4	51.7	76.9	45.1	82.9	52.1	96.9	70.6
20	99.6	62.4	90.0	65.4	78.1	50.8	70.1	47.8	85.5	48.8	97.3	63.0
21	97.3	64.1	79.0	57.8	76.9	49.7	71.5	50.0	87.9	48.1	93.7	67.2
22	97.0	69.1	61.0	58.0	79.9	50.7	71.9	48.8	91.8	49.9	87.7	55.8
23	97.7	67.4	63.0	53.0	79.1	46.1	74.2	48.9	91.7	52.0	86.4	69.2
24	97.5	69.8	72.0	55.6	79.2	53.9	76.1	55.1	91.9	59.5	89.7	61.0
25	98.2	66.1	75.5	56.0	73.9	38.3	81.5	49.5	75.1	40.3	71.1	59.8
26	99.1	64.0	79.0	60.8	74.0	47.0	79.7	58.1	76.8	49.9	95.5	69.5
27	99.3	62.0	83.9	58.1	74.0	48.9	79.0	47.9	81.0	44.5	96.8	67.3
28	98.5	64.0	85.2	62.9	66.2	52.5	76.8	46.0	82.9	47.6	91.5	65.2
29	96.7	63.5	85.1	60.0	73.8	47.9	76.9	48.9	...	...	87.3	60.6
30	95.4	62.3	83.1	56.9	72.1	42.9	79.0	52.8	...	...	92.3	65.0
31	94.0	62.0	...	...	69.9	44.1	81.5	53.0	...	...	95.4	69.5

in Shade from 10th October 1896 to 30th September 1897.

April 1897.		May 1897.		June 1897.		July 1897.		Aug. 1897.		Sept. 1897.	
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
95.3	67.7	105.8	71.0	106.6	79.5	102.9	80.9	98.3	80.7	94.7	79.0
95.3	66.2	109.7	75.0	109.0	84.9	103.1	81.6	96.9	81.8	94.0	76.8
96.6	64.6	111.4	80.2	106.0	80.8	102.5	81.3	97.8	81.5	91.0	75.9
97.1	69.8	113.0	79.0	105.9	77.9	101.2	81.8	99.7	79.7	91.6	74.7
97.0	73.2	110.0	78.5	105.5	85.0	100.0	85.0	100.2	79.9	91.8	76.0
90.7	66.4	105.8	76.2	111.2	85.9	101.8	85.5	97.6	84.0	91.1	73.8
93.9	61.1	102.4	79.1	115.0	83.7	105.1	86.1	101.0	77.8	92.3	75.6
97.8	59.5	103.0	76.5	118.3	88.7	106.0	86.1	95.3	82.9	95.0	76.0
102.2	65.8	107.5	73.4	119.3	88.9	108.1	84.9	100.7	79.6	95.9	74.2
103.3	65.3	109.9	79.0	120.9	91.7	110.0	83.2	86.7	79.7	97.4	80.0
104.8	70.0	109.6	82.1	111.9	85.7	104.7	80.1	91.5	78.3	101.9	79.4
102.9	73.8	109.6	82.8	109.1	83.6	94.4	78.7	91.1	78.9	100.0	81.0
103.1	64.5	111.4	83.5	111.9	85.2	91.3	77.9	93.9	80.5	99.9	75.8
106.6	69.8	109.8	83.1	107.4	84.1	90.8	78.1	95.6	81.2	86.7	77.5
106.8	76.3	111.4	83.3	104.0	83.5	90.1	78.8	84.0	77.9	89.0	77.4
109.9	76.5	113.4	83.4	104.2	77.5	94.5	79.1	91.0	79.0	87.2	76.4
111.2	75.5	111.5	83.2	99.8	79.4	96.3	79.1	93.0	78.7	94.5	75.0
111.1	77.9	112.7	81.8	107.3	88.2	98.7	82.6	80.2	76.0	93.0	74.8
109.4	77.0	106.6	82.1	110.7	85.0	89.7	79.5	85.5	76.1	94.7	77.8
108.1	76.5	106.9	83.8	110.1	85.7	86.8	77.5	89.9	77.3	96.5	75.9
95.9	63.2	106.5	82.1	109.1	85.8	93.5	80.0	85.2	74.2	90.2	75.3
100.8	70.0	108.9	81.5	108.2	85.6	95.5	81.2	83.1	76.6	94.2	76.6
99.9	76.9	107.1	80.8	105.5	82.5	93.3	79.8	85.0	76.8	97.5	75.4
98.3	69.1	109.9	80.2	103.0	81.8	86.9	77.9	90.0	74.9	98.4	83.1
98.8	77.1	107.6	81.2	104.0	81.6	97.9	81.6	91.7	76.1	97.2	80.9
103.0	77.8	108.2	85.8	101.1	84.1	94.0	79.5	95.0	76.0	94.8	79.2
103.8	73.5	112.4	87.5	103.2	83.8	91.5	78.2	95.6	81.0	96.9	79.2
98.2	70.6	114.0	90.5	104.1	80.6	98.0	81.7	97.1	80.5	94.1	75.2
99.8	74.4	114.2	86.7	102.2	79.6	98.9	81.8	97.6	77.8	95.8	75.9
102.0	70.1	111.9	81.1	102.2	79.7	101.9	82.0	96.0	79.9	95.8	75.9
...	...	110.5	85.2	...	...	100.3	80.7	95.8	78.9	...	...

Statement showing the Maximum and Minimum Temperature

Date.	Oct. 1897.		Nov. 1897.		Dec. 1897.		Jan. 1898.		Feb. 1898.		March 1898.		April 1898.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	95.9	76.9	93.6	58.6	85.2	49.0	77.9	47.4	88.8	54.0	93.9	57.7	100.2	65.8
2	95.6	74.5	93.0	62.8	85.4	49.2	80.0	47.5	83.9	53.8	87.0	43.8	100.8	71.8
3	93.5	77.0	91.0	65.0	84.9	49.0	81.1	56.2	84.1	55.2	68.0	40.9	100.2	68.8
4	99.2	70.9	91.9	58.1	84.2	49.6	76.9	44.2	83.1	51.3	72.0	44.5	99.2	65.0
5	98.4	72.2	92.0	57.0	83.0	54.4	68.8	40.6	82.1	48.1	78.1	51.4	102.3	67.8
6	97.9	73.4	90.4	57.9	83.0	57.3	70.1	37.0	82.0	50.0	83.2	55.4	103.5	71.0
7	94.2	72.5	91.0	58.5	82.0	54.8	73.7	37.9	82.3	54.3	89.5	52.0	100.0	73.0
8	94.0	73.5	89.8	58.2	84.8	50.9	77.0	41.7	81.9	56.8	91.3	62.8	100.0	64.8
9	89.3	70.0	90.3	...	83.7	51.1	83.3	47.3	81.3	56.0	95.3	64.7	100.0	62.6
10	92.7	70.8	90.6	53.8	83.0	58.5	83.5	50.7	69.0	52.9	91.4	63.0	105.0	71.5
11	94.5	67.9	93.0	53.4	82.7	56.0	86.1	52.0	66.8	49.8	87.6	63.1	107.0	81.5
12	96.1	66.2	93.5	56.0	82.0	48.6	85.1	48.1	68.1	50.3	91.1	61.9	108.3	70.8
13	95.6	66.7	93.1	55.8	73.5	46.0	84.9	51.4	74.0	51.1	94.8	67.9	108.7	69.0
14	95.5	67.2	91.8	...	69.7	43.0	82.8	50.0	77.1	57.0	101.0	62.8	110.0	83.1
15	96.9	67.2	92.5	56.7	70.8	37.0	85.2	54.9	80.8	60.7	97.5	67.1	109.9	79.4
16	96.7	64.2	91.1	55.5	74.0	39.5	82.1	49.1	75.0	59.3	96.2	63.0	110.0	79.4
17	96.2	62.3	91.0	54.3	76.0	46.8	82.7	50.8	83.0	58.0	97.5	65.1	107.6	73.4
18	95.0	58.9	89.0	53.0	79.5	47.3	83.2	52.3	82.7	57.1	100.1	65.8	107.4	77.1
19	93.1	57.8	89.8	...	81.5	50.4	84.6	48.9	74.4	52.4	92.0	61.6	108.0	74.4
20	94.0	57.1	87.9	54.9	83.0	49.8	85.2	54.3	74.1	43.8	86.4	68.8	108.9	72.7
21	93.5	58.2	85.1	53.3	85.0	48.1	84.8	53.7	81.8	52.5	89.2	53.0	109.3	79.3
22	93.7	55.8	89.0	53.0	84.9	55.2	84.1	58.6	83.0	52.5	89.1	55.6	108.0	78.2
23	94.3	53.6	84.9	53.5	80.6	51.1	87.0	53.0	78.0	52.0	96.0	62.4	107.7	74.0
24	92.7	55.2	84.1	52.1	81.7	56.0	90.0	58.9	76.3	48.6	101.1	64.0	107.2	84.0
25	92.8	53.0	84.1	54.4	80.9	52.9	85.5	55.0	78.8	55.6	101.0	69.0	109.2	87.5
26	91.5	56.1	83.2	54.5	77.1	51.2	76.9	45.8	84.5	53.3	100.6	63.9	110.1	80.7
27	91.0	60.8	83.9	51.0	77.9	50.7	79.0	46.2	86.4	55.2	99.0	65.7	110.0	79.8
28	92.2	58.5	84.3	53.0	77.9	48.0	86.1	51.3	92.6	53.9	100.0	68.0	108.3	82.8
29	93.0	57.2	83.2	54.3	79.4	48.9	87.2	52.5	...	...	101.9	69.0	110.1	82.0
30	92.7	59.1	83.1	47.0	80.1	54.0	89.9	50.6	...	...	103.6	71.2	109.8	85.0
31	92.3	58.2	...	...	80.3	46.4	90.0	51.1	...	...	102.8	68.1	...	...

in Shade from 1st October 1897 to 30th November 1898.

May 1898.		June 1898.		July 1898.		Aug. 1898.		Sept. 1898.		Oct. 1898.		Nov. 1898.	
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
109.9	81.7	108.2	81.8	99.5	82.8	93.3	78.2	99.3	75.0	97.0	72.1	96.9	64.0
108.1	75.6	107.0	81.4	100.0	83.0	95.0	78.0	81.0	74.9	99.1	70.7	97.0	63.8
109.8	78.7	109.4	81.2	99.0	83.8	96.0	78.8	89.9	77.2	100.1	69.0	94.0	51.0
109.9	76.5	110.0	81.1	103.0	83.8	96.7	78.7	94.7	77.3	101.7	68.8	90.8	61.0
112.2	76.4	107.5	81.8	106.2	79.0	97.7	77.9	92.1	78.0	103.0	68.0	89.4	63.4
113.3	82.8	106.7	80.0	99.8	84.2	95.8	77.2	93.2	78.3	102.3	66.9	85.0	60.0
113.8	77.2	106.9	80.2	102.2	82.0	94.8	76.1	91.2	75.3	103.7	69.4	85.1	54.6
110.0	77.0	106.5	80.1	98.0	76.0	94.0	78.2	94.3	76.1	104.2	67.2	83.2	54.6
102.2	76.5	106.0	83.0	94.3	78.9	90.7	77.2	97.5	78.6	103.1	64.0	84.5	58.0
103.3	77.5	105.0	86.5	94.8	81.2	90.1	76.1	99.9	80.8	103.0	64.2	86.9	63.0
102.3	76.1	106.0	88.1	98.7	79.5	93.6	76.1	100.5	79.6	102.4	64.9	91.8	62.9
98.8	78.1	111.2	85.5	93.1	79.0	94.0	76.0	102.0	76.9	100.1	68.0	93.0	61.0
98.8	77.0	106.8	85.0	94.0	79.8	95.1	73.9	100.6	74.0	99.2	66.3	93.1	50.2
99.2	71.7	107.1	85.0	97.8	81.0	96.2	73.9	91.0	75.4	100.1	64.5	93.0	58.9
99.7	69.8	106.3	83.8	101.1	77.8	96.7	75.2	92.3	76.8	101.8	69.6	93.3	66.4
101.5	78.6	106.5	87.2	95.7	78.5	96.0	75.1	89.0	75.1	101.1	65.0	93.2	54.9
101.3	80.4	109.1	84.9	96.5	78.1	96.8	79.0	94.7	76.1	98.8	69.9	92.6	59.5
100.7	79.1	110.0	84.6	96.2	79.7	96.0	78.1	94.3	74.0	97.7	68.5	94.1	66.0
94.7	71.5	108.5	83.6	99.0	76.0	98.4	81.7	94.1	72.4	98.1	69.5	91.8	52.9
98.8	76.5	106.7	82.7	76.5	74.0	97.0	77.5	92.9	69.2	100.1	73.8	88.2	56.1
104.0	82.4	105.4	81.7	84.1	76.2	92.3	80.0	90.3	71.9	100.2	66.3	90.2	54.6
108.0	83.6	104.8	79.3	92.3	76.0	97.1	80.4	93.0	72.0	99.0	62.2	90.9	54.5
110.5	84.3	100.8	80.5	93.5	79.8	95.5	81.3	94.4	72.0	98.3	63.0	91.2	61.0
111.5	85.1	99.6	81.2	94.5	79.4	97.9	81.9	95.8	74.9	97.9	64.2	90.8	58.6
112.5	83.5	100.8	82.0	98.0	80.0	97.2	78.0	98.3	73.7	97.3	62.5	89.6	64.5
111.3	84.4	99.9	81.4	100.8	82.9	94.6	77.9	99.5	76.3	94.2	60.1	89.0	58.7
108.8	80.0	101.1	84.1	103.6	84.0	91.9	80.5	99.6	69.2	93.2	57.4	89.8	52.1
107.8	86.4	102.0	83.5	101.2	82.5	93.7	76.5	98.8	72.4	93.6	58.0	86.8	62.5
109.1	87.0	101.5	...	98.9	80.8	95.1	77.1	97.8	72.5	94.9	57.9	85.0	53.0
113.4	88.9	99.0	82.4	94.7	77.0	95.8	77.0	97.1	69.0	95.5	59.3	86.8	52.8
112.8	83.1	...	...	93.1	78.7	97.0	80.0	...	...	96.0	57.9	...	...

Statement showing Dry and Wet Bulbs at 8 A.M. *Local*

Date.	Oct. 1896.		Nov. 1896.		Dec. 1896.		Jan. 1897.		Feb. 1897.		March 1897.	
	Dry	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
1	...	...	73.5	54.8	56.4	44.9	52.5	45.8	54.7	49.2	63.8	59.0
2	...	..	73.5	52.8	58.8	47.0	50.4	44.7	55.5	49.0	60.0	51.0
3	...	...	71.2	52.1	58.9	47.8	50.8	44.4	56.0	48.8	60.5	50.0
4	...	...	72.6	52.9	61.8	49.7	54.1	46.2	57.3	49.0	67.0	51.2
5	...	...	72.9	54.1	60.0	48.9	54.9	45.1	59.6	49.0	66.0	51.7
6	...	...	70.0	56.1	60.8	47.9	53.9	46.7	56.8	48.1	65.6	49.7
7	...	...	70.9	58.0	59.8	48.1	59.9	49.8	60.7	51.7	66.9	55.8
8	...	...	74.3	58.2	61.6	49.9	60.8	50.8	57.0	50.0	69.8	62.9
9	...	...	75.8	57.8	57.3	48.5	59.0	50.8	61.1	50.3	67.5	63.0
10	79.8	62.8	76.6	58.8	58.1	48.1	58.0	49.0	59.0	48.0	64.8	45.8
11	77.4	64.0	74.8	58.0	59.8	48.8	61.5	57.2	58.8	50.0	63.4	49.0
12	77.0	64.9	75.0	59.9	57.7	47.8	52.8	49.0	53.1	43.7	63.0	47.8
13	79.9	65.5	73.1	58.8	57.8	47.0	53.9	48.9	54.7	47.0	65.3	48.8
14	75.0	62.0	73.9	58.4	57.0	45.2	53.9	52.0	55.3	47.0	69.6	51.1
15	74.8	59.6	71.8	55.0	55.1	44.9	39.9	37.7	57.0	46.0	69.8	52.3
16	78.2	64.4	69.1	54.2	58.0	47.3	41.7	39.4	58.8	47.0	71.0	54.7
17	79.0	63.9	70.3	55.2	60.4	45.8	41.5	37.8	55.6	44.8	70.1	57.0
18	82.0	61.0	70.4	55.9	57.7	44.9	49.5	40.9	61.0	45.9	72.4	57.9
19	74.8	58.7	70.5	56.0	54.8	42.4	52.0	46.9	62.7	47.1	75.2	55.7
20	75.4	61.5	67.5	52.5	54.8	42.0	50.8	43.3	58.0	46.8	75.5	55.2
21	77.7	63.9	57.6	57.0	53.7	41.2	52.0	44.4	62.8	46.8	71.5	62.0
22	79.8	67.5	58.9	57.7	54.0	42.1	51.0	42.0	62.5	47.2	64.0	50.0
23	77.8	66.1	61.0	59.8	55.0	44.0	52.3	42.1	62.2	51.6	71.4	53.6
24	79.0	67.6	61.9	59.0	55.8	42.5	57.5	45.7	62.0	56.7	71.0	54.0
25	77.9	66.0	61.1	56.9	48.2	39.0	55.8	47.8	51.5	41.0	73.9	55.4
26	75.0	62.7	66.2	58.8	50.9	39.9	59.0	48.0	54.8	41.7	77.7	59.2
27	75.5	61.0	66.1	60.9	52.0	41.9	50.1	43.8	56.5	43.7	70.9	59.0
28	78.9	64.1	69.7	65.0	51.9	50.7	55.3	46.3	57.8	44.1	68.6	61.0
29	76.3	57.8	65.5	54.3	53.7	50.0	54.9	43.0	...	...	67.3	47.8
30	76.0	57.5	60.1	48.0	45.5	45.0	57.2	44.8	...	...	71.9	52.4
31	72.4	54.5	...	...	51.1	46.1	57.0	45.1	...	...	76.6	56.1

Time, from 10th October 1896 to 30th September 1897.

April 1897.		May 1897.		June 1897.		July 1897.		Aug. 1897.		Sept. 1897.	
Dry	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
78.0	58.4	91.7	64.0	88.2	71.0	85.2	74.3	83.7	77.7	80.9	77.6
77.5	56.0	90.3	62.8	88.2	69.4	85.2	75.4	84.6	77.1	78.8	73.8
77.1	56.0	90.7	66.0	85.0	74.3	83.3	74.2	83.8	76.8	77.2	74.0
78.1	58.6	88.1	70.8	85.0	72.8	84.0	73.0	84.5	74.0	78.0	72.8
74.4	55.0	84.7	75.2	92.7	69.4	86.1	75.6	81.7	74.9	79.0	73.0
74.9	59.0	83.1	70.0	96.0	67.2	86.8	75.7	84.0	76.7	77.1	72.6
78.5	58.2	82.7	74.7	98.6	67.9	89.8	76.8	80.8	78.0	80.1	74.4
77.1	55.9	92.3	64.8	103.6	67.8	91.8	77.0	88.1	80.0	80.8	75.0
82.8	57.1	89.1	62.6	103.9	68.7	86.9	79.8	80.6	79.0	81.0	74.7
81.8	58.0	86.3	65.8	93.6	74.1	87.1	79.7	80.3	77.8	85.7	74.7
81.8	62.0	85.9	71.2	87.9	76.6	85.1	81.0	79.7	78.0	86.2	73.4
83.8	61.0	88.4	69.9	86.4	76.2	80.0	78.0	81.8	78.9	88.0	79.1
81.8	59.3	88.1	76.4	87.8	78.1	79.9	77.0	82.3	79.3	78.0	75.9
83.1	62.1	87.9	75.9	87.8	77.1	78.7	77.1	82.2	80.0	79.5	75.9
85.8	62.8	89.2	75.0	86.2	77.1	82.6	76.1	80.8	78.0	80.1	77.3
87.7	61.9	88.2	76.0	82.8	73.1	81.7	75.7	80.0	78.2	80.0	76.7
93.1	63.6	89.7	70.1	87.7	74.1	83.8	78.6	78.3	77.3	78.7	75.9
87.7	61.7	87.7	66.7	94.3	73.8	84.6	78.7	76.7	76.2	80.3	76.3
85.1	63.9	84.5	72.0	86.8	78.0	83.8	81.0	80.0	75.4	82.8	76.0
81.3	66.3	86.2	75.0	87.9	77.0	79.1	77.7	78.1	77.0	80.0	76.0
77.0	55.9	86.2	74.7	87.6	77.6	84.5	80.2	75.4	75.1	81.3	77.2
84.0	61.9	84.8	75.6	88.0	77.1	82.6	78.9	77.5	76.0	83.3	77.3
80.7	67.7	84.8	76.0	86.1	76.1	82.5	80.4	78.4	75.2	82.5	77.7
78.9	67.2	85.0	76.0	85.0	75.1	81.7	80.0	78.7	74.6	85.1	75.4
85.1	67.9	84.0	76.2	84.6	74.7	84.1	80.0	79.5	75.6	86.1	75.9
84.0	68.0	91.8	74.3	86.7	75.1	84.2	78.8	81.2	75.7	82.5	77.0
78.0	65.0	92.8	76.1	83.9	74.9	83.0	78.0	84.7	78.8	82.0	77.0
80.2	60.9	95.0	72.8	84.1	72.8	86.3	79.0	87.4	80.1	80.0	77.0
81.7	62.2	94.5	64.0	83.9	74.0	86.2	79.0	82.9	78.4	81.1	77.2
86.2	61.7	89.1	70.6	84.0	73.7	86.0	78.3	82.9	77.1	80.9	75.4
...	...	87.7	74.1	...	...	82.6	77.7	83.1	78.6	...	...

Statement showing Dry and Wet Bulbs at 8 A.M. Local

Date.	Oct. 1897.		Nov. 1897.		Dec. 1897.		Jan. 1898.		Feb. 1898.		Mar. 1898.		April 1898.	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
1	83.3	77.4	70.9	58.9	58.6	49.0	53.0	47.3	61.0	55.6	66.1	53.1	76.2	63.7
2	81.1	76.6	68.7	59.2	58.5	48.8	53.8	47.8	59.5	53.0	46.9	35.0	79.0	61.0
3	81.0	76.9	70.8	65.8	56.9	47.7	59.2	56.8	62.1	50.1	47.1	36.1	77.7	61.4
4	78.9	73.7	67.5	55.7	62.0	52.0	47.6	38.8	56.9	47.9	52.7	40.0	77.9	59.0
5	78.1	70.1	69.7	55.7	61.0	52.0	45.9	38.7	56.2	45.9	57.8	43.0	78.9	57.1
6	78.7	72.8	70.8	58.0	60.4	50.1	45.7	37.6	55.3	44.0	62.3	46.2	79.0	61.9
7	80.0	74.3	67.7	55.0	62.1	51.2	46.9	37.3	57.3	49.2	62.9	48.2	79.1	57.6
8	76.4	74.9	70.9	57.0	56.8	49.7	48.3	38.6	59.4	50.2	65.6	50.0	76.2	54.8
9	77.0	72.7	69.6	57.3	60.4	52.4	56.0	43.0	56.8	54.8	69.2	53.6	78.8	55.8
10	76.4	69.1	67.0	56.2	60.2	52.0	57.0	44.1	55.2	54.8	66.9	55.7	81.9	57.9
11	77.0	68.7	66.8	56.0	59.9	52.8	57.7	45.2	50.8	50.8	65.6	52.1	88.3	66.6
12	77.0	66.0	69.9	55.1	55.0	51.0	56.7	45.6	54.6	52.3	71.8	51.8	83.8	59.0
13	76.7	66.0	66.0	54.8	56.0	45.1	56.9	46.6	57.0	53.4	75.0	55.1	86.8	61.3
14	78.5	66.2	65.1	56.1	48.9	46.5	57.0	45.6	59.1	53.2	70.8	55.1	91.7	66.2
15	76.1	65.2	63.0	54.0	45.4	40.2	59.1	47.0	64.2	59.9	73.3	56.6	84.2	63.0
16	75.1	61.9	66.5	55.0	50.4	42.5	55.2	45.7	63.3	63.1	72.5	59.0	87.0	68.0
17	75.5	58.6	63.7	53.2	54.2	43.0	59.1	47.2	63.0	61.8	74.0	57.1	86.8	62.9
18	75.6	59.6	63.8	54.0	55.6	44.0	58.6	46.9	61.1	52.1	73.3	57.8	87.2	63.7
19	71.5	57.3	63.0	52.8	57.5	45.1	56.1	46.0	55.5	40.0	66.9	54.9	86.8	63.1
20	74.3	56.9	66.0	55.0	58.0	48.3	62.7	49.6	51.2	42.1	70.8	51.2	86.2	61.2
21	72.1	55.8	64.0	53.0	56.1	47.0	60.8	48.8	61.1	46.2	63.7	49.9	86.8	66.0
22	68.1	53.3	61.6	50.8	58.4	50.0	64.2	51.0	58.0	45.7	70.0	52.4	86.2	66.2
23	66.2	53.0	62.6	51.6	56.6	46.8	61.4	51.6	56.9	44.7	71.1	54.8	86.5	65.0
24	66.9	54.0	63.5	51.0	56.8	48.0	63.2	53.0	54.9	42.3	74.2	57.9	90.1	63.1
25	69.2	55.7	61.9	50.2	57.0	47.0	58.1	54.1	61.6	45.4	76.0	61.0	91.8	62.3
26	69.1	58.1	60.5	49.1	54.0	44.8	50.4	43.9	62.6	46.3	71.1	55.9	91.0	62.7
27	71.5	62.7	60.0	48.9	53.5	43.9	54.9	45.2	65.1	48.7	75.7	57.7	90.0	60.8
28	70.2	59.0	61.0	49.8	53.6	44.9	57.8	45.8	65.1	50.8	81.0	59.2	91.3	60.8
29	70.0	58.8	62.9	50.5	57.0	48.3	62.7	48.2	...	...	81.8	60.1	91.7	63.8
30	68.8	57.1	57.8	49.0	58.5	49.2	57.1	49.0	...	...	78.6	59.1	91.4	61.2
31	73.0	59.7	...	...	51.5	46.5	59.5	51.3	...	...	78.5	58.7	...	...

Time, from 1st October 1897 to 30th November 1898.

May 1898.		June 1898.		July 1898.		Aug. 1898.		Sept. 1898		Oct. 1898.		Nov. 1898.	
Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
87.9	64.2	85.2	75.1	85.1	75.6	81.2	76.8	75.1	74.6	80.9	66.8	72.8	55.1
84.9	67.0	85.5	71.5	85.4	75.2	80.1	74.0	76.8	75.1	80.3	65.8	70.0	53.9
89.2	61.7	87.4	71.8	86.1	76.3	81.3	75.0	81.4	76.9	81.3	68.7	68.9	52.7
96.0	63.6	87.3	74.6	87.0	76.9	80.5	74.0	82.7	76.9	80.2	66.2	66.7	56.9
94.3	61.9	85.0	74.0	80.2	76.9	80.0	73.3	79.5	74.6	84.1	63.9	68.0	54.0
91.7	65.0	83.6	76.0	86.2	77.7	80.3	71.7	81.6	74.9	78.4	63.9	65.7	50.2
87.4	69.6	83.6	76.8	85.6	78.6	79.2	73.0	80.7	74.0	81.0	64.7	64.7	47.7
82.0	72.1	84.3	76.9	80.3	75.1	79.5	73.0	82.9	75.0	79.6	62.1	63.3	48.8
82.2	73.1	85.9	76.1	82.1	76.8	78.0	73.0	85.2	74.8	80.7	63.2	66.3	50.1
81.1	73.9	88.6	76.0	85.0	76.2	79.7	73.0	85.3	75.8	79.9	62.4	70.0	53.6
81.9	72.2	92.2	78.1	84.0	75.9	78.1	72.9	84.7	76.0	77.9	61.4	71.9	56.9
83.7	73.0	90.1	79.1	82.8	75.8	79.5	72.8	81.4	76.3	80.2	63.7	72.1	59.8
81.9	71.3	89.2	79.9	83.6	77.1	79.3	71.9	77.1	74.9	77.9	61.7	67.1	51.0
81.8	66.8	87.9	79.7	82.7	75.2	79.8	72.1	79.6	75.8	75.8	60.1	68.3	58.2
79.8	70.0	88.6	75.8	81.8	77.0	80.8	71.7	79.8	76.1	79.3	63.1	73.9	59.6
83.0	71.0	89.0	78.8	80.8	73.9	79.2	72.7	78.6	76.3	74.3	59.1	68.3	51.8
84.9	72.1	90.1	78.1	82.0	72.8	82.3	74.2	79.1	74.6	76.8	64.9	69.7	54.7
81.8	72.6	88.0	79.0	83.0	75.3	82.9	73.9	77.9	72.6	76.3	70.6	74.7	58.8
78.1	70.8	86.5	77.2	75.9	75.4	81.7	72.0	78.0	72.0	79.7	61.2	66.7	51.7
86.5	69.9	86.6	76.1	76.1	74.8	81.4	72.7	77.7	70.7	75.8	56.8	65.8	50.2
87.9	73.5	86.3	74.0	78.8	76.7	83.7	73.6	77.5	71.1	74.2	57.7	65.8	50.8
89.5	73.1	85.2	73.3	78.3	75.1	81.9	71.9	79.8	70.0	75.0	58.6	63.6	50.6
89.8	70.6	85.8	74.0	81.5	79.0	83.7	74.2	78.2	70.2	74.5	59.4	67.7	53.8
89.9	70.8	84.1	74.1	85.2	79.3	82.7	73.7	78.1	70.3	77.9	60.1	68.3	57.0
90.0	68.1	83.2	75.0	87.2	80.7	80.5	74.1	77.8	67.9	73.3	54.7	71.5	57.0
88.4	70.5	84.5	75.0	90.7	81.4	80.3	74.3	83.9	67.1	70.0	53.0	68.2	55.8
87.9	72.8	87.2	77.0	87.9	78.1	82.7	74.0	81.1	69.2	71.2	52.7	61.3	51.3
89.2	75.2	85.9	74.9	87.8	80.6	79.8	72.9	79.1	68.8	70.7	52.2	65.8	51.7
93.0	70.6	85.5	75.0	84.5	81.0	79.8	72.8	80.2	73.2	72.7	53.2	65.0	48.9
93.1	66.9	84.8	74.6	80.3	76.7	78.3	72.3	79.5	63.2	74.0	56.3	63.3	49.2
85.3	76.5	...	...	80.8	76.7	83.2	75.7	...	...	73.0	54.7	...	...

Statement showing the Solar Radiation and Grass Radiation Thermometers for the Month of January.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	...	...	124.0	35.0	119.9	36.0	...
2	...	...	124.0	36.5	119.4	37.1	...
3	...	...	124.3	39.7	120.2	50.0	...
4	...	...	125.6	43.0	115.0	31.5	...
5	...	.	126.5	38.9	110.9	26.5	...
6	...	...	130.8	35.3	111.8	25.4	...
7	...	...	135.5	44.0	115.0	23.5	...
8	...	...	138.2	50.5	119.5	20.8	...
9	...	...	134.8	41.7	123.5	35.7	...
10	...	...	136.3	41.8	124.0	38.3	...
11	...	...	136.4	47.8	126.0	37.9	...
12	...	...	129.8	38.2	125.0	36.2	...
13	...	...	132.5	36.4	123.4	37.9	...
14	...	...	136.5	50.4	122.7	40.3	...
15	...	...	117.1	21.6	124.9	44.0	...
16	...	...	119.5	29.4	121.5	35.5	...
17	...	...	117.0	31.8	122.9	38.0	...
18	...	...	121.5	40.5	124.0	38.9	...
19	...	...	130.3	33.5	125.3	35.3	...
20	...	...	124.8	39.5	126.0	42.5	...
21	...	...	130.6	43.6	125.0	41.9	...
22	...	...	125.8	43.4	124.0	47.9	...
23	...	...	129.0	41.5	124.8	44.3	...
24	...	...	133.0	49.7	128.5	52.0	...
25	...	...	132.5	38.0	123.8	49.0	...
26	...	...	133.7	54.2	118.3	33.4	...
27	...	...	133.2	35.4	121.6	35.2	...
28	...	...	131.0	33.0	126.9	38.0	...
29	...	...	135.0	34.0	118.5	40.6	...
30	...	...	136.0	40.0	131.0	39.9	..
31	...	...	137.0	41.3	129.5	39.4	...

Statement showing the Solar Radiation and Grass Radiation Thermometers for the Month of February.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	...	...	139.0	47.1	129.0	43.0	...
2	...	...	130.3	46.0	124.5	43.1	...
3	...	...	131.7	43.0	125.0	44.3	...
4	...	...	133.8	46.5	126.4	40.9	...
5	...	...	134.8	46.3	123.5	35.0	...
6	..	...	139.3	38.0	125.7	35.8	...
7	...	...	139.0	52.5	125.3	47.0	...
8	...	...	133.8	46.8	124.5	53.2	...
9	...	...	138.7	46.5	122.0	54.0	...
10	...	...	135.8	47.0	105.6	46.0	...
11	...	...	137.0	37.3	119.0	44.2	...
12	...	...	139.2	31.5	110.5	43.0	...
13	...	...	133.7	38.6	120.0	43.0	...
14	...	...	133.0	44.8	120.0	48.9	...
15	...	...	136.0	45.0	126.0	57.3	...
16	...	...	138.0	34.0	119.7	53.7	...
17	...	...	139.3	32.8	123.1	46.6	...
18	...	...	139.0	42.0	122.2	53.0	...
19	...	...	141.0	33.2	117.4	46.0	...
20	...	...	143.8	34.2	117.5	30.0	...
21	...	...	144.3	35.0	124.9	39.3	...
22	...	...	147.4	37.8	127.3	48.1	...
23	...	...	147.0	44.0	122.2	44.2	...
24	...	...	146.0	54.7	122.3	41.9	...
25	...	...	134.5	35.8	122.0	49.0	...
26	...	...	136.8	38.8	129.4	40.6	...
27	...	...	140.7	31.4	130.8	43.7	...
28	...	...	144.2	35.2	135.3	42.0	...

Statement showing the Solar Radiation and Grass Radiation Thermometer for the Month of March.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	...	...	141.2	46.6	134.5	46.0	...
2	...	...	139.0	46.0	128.9	34.3	...
3	...	...	142.4	43.4	112.3	28.0	...
4	...	...	144.0	47.8	119.0	30.2	...
5	...	...	146.2	42.0	125.0	30.0	...
6	...	...	147.8	42.5	129.4	42.9	...
7	...	...	150.1	43.4	135.0	41.2	...
8	...	...	145.9	51.3	135.3	54.0	...
9	...	...	149.6	56.9	139.0	57.3	...
10	...	...	140.5	40.2	136.0	59.2	...
11	...	...	145.2	37.6	135.7	58.9	...
12	...	...	143.8	35.3	135.0	54.0	...
13	...	...	145.0	38.0	137.2	58.4	...
14	...	...	166.8	44.0	147.6	53.0	...
15	...	...	162.6	47.0	144.0	54.0	...
16	...	...	162.0	47.5	143.0	52.0	..
17	...	...	153.5	59.6	142.0	55.0	...
18	...	...	152.0	54.2	142.5	55.0	...
19	...	...	153.4	64.0	135.2	56.5	...
20	...	...	156.9	51.0	134.0	59.0	...
21	...	...	153.0	57.9	136.0	39.0	...
22	...	...	149.6	45.0	137.9	45.5	...
23	...	...	149.3	66.0	139.0	51.7	...
24	...	...	147.8	52.0	144.9	55.0	...
25	...	...	149.5	47.0	145.2	57.9	...
26	...	...	159.0	61.0	147.5	52.2	...
27	...	...	152.9	63.0	144.7	57.3	...
28	...	...	148.3	61.0	145.0	54.2	...
29	...	...	146.0	48.0	147.2	55.5	...
30	...	...	154.9	48.9	147.8	66.0	...
31	...	...	157.8	60.4	145.0	57.0	...

Statement showing the Solar Radiation and Grass Radiation Thermometers for the Month of April.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	...	...	155.8	55.9	142.0	57.8	...
2	...	...	156.1	55.1	144.0	65.1	...
3	...	...	157.4	51.8	145.4	59.2	...
4	...	...	158.5	63.0	145.0	54.0	...
5	...	...	160.8	71.0	147.5	55.8	..
6	...	...	146.0	53.0	148.0	66.1	...
7	...	...	150.8	47.7	144.5	65.0	...
8	...	...	155.8	45.2	146.3	56.3	...
9	...	...	159.6	50.9	145.9	50.7	...
10	...	...	162.0	49.0	148.7	62.9	...
11	...	...	161.7	57.9	152.0	72.0	...
12	...	...	161.8	58.0	152.3	60.1	...
13	...	...	161.5	52.2	153.0	57.3	...
14	...	...	164.2	59.6	151.9	73.5	...
15	...	...	163.7	64.7	152.3	71.7	...
16	...	...	166.8	64.3	152.8	70.0	...
17	...	...	169.8	65.0	152.4	60.2	...
18	...	...	169.8	67.8	152.8	71.0	...
19	...	...	168.2	69.9	153.1	61.0	...
20	...	...	166.2	66.8	153.3	61.2	...
21	...	...	156.0	51.1	154.1	69.4	...
22	...	...	160.8	59.4	152.0	71.8	...
23	...	...	163.1	69.9	151.5	66.0	...
24	...	...	165.5	61.6	150.2	71.3	...
25	...	...	162.7	68.8	152.8	83.3	...
26	...	...	165.9	71.3	154.1	73.8	...
27	...	...	155.0	66.4	156.0	81.0	..
28	...	...	153.1	54.8	158.0	67.8	...
29	...	...	157.9	60.4	157.9	78.4	...
30	...	...	160.4	57.1	165.8	80.4	...

Statement showing the Solar Radiation and Grass Radiation Thermometers for the Month of May.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	...	...	163.8	60.0	152.7	79.0	...
2	...	...	165.1	62.1	164.0	66.4	...
3	...	...	165.3	70.0	153.8	75.9	...
4	...	...	167.2	73.6	154.2	65.0	...
5	...	...	166.8	68.0	159.0	65.3	...
6	...	...	162.3	69.7	159.1	79.9	. .
7	...	...	158.5	76.9	158.8	73.0	...
8	...	...	157.0	64.1	154.4	75.5	...
9	...	...	165.4	60.7	144.6	75.8	...
10	...	...	165.9	74.5	149.5	75.9	...
11	...	...	164.9	78.8	147.8	75.5	...
12	...	...	164.2	78.9	143.1	77.2	...
13	...	...	166.2	79.8	147.0	75.9	...
14	...	...	164.8	79.7	144.7	63.7	...
15	...	...	166.4	80.7	144.3	64.0	...
16	...	...	167.1	72.6	149.9	71.8	...
17	...	...	164.2	78.9	146.5	74.2	...
18	...	...	165.2	76.2	147.5	73.0	...
19	...	...	161.0	79.5	144.2	66.5	...
20	...	...	162.8	78.8	143.7	68.5	...
21	...	...	157.3	78.8	155.0	78.2	...
22	...	...	163.5	78.5	155.8	79.4	...
23	...	...	162.5	78.3	155.0	75.5	...
24	...	...	164.9	76.9	155.5	82.4	...
25	...	...	164.5	78.7	156.0	81.4	...
26	...	...	163.2	80.2	153.8	81.0	...
27	..	...	164.1	82.3	153.5	77.1	...
28	...	...	168.8	86.9	152.7	81.3	...
29	...	...	170.0	79.1	152.5	84.7	...
30	...	...	168.0	74.0	158.4	86.8	...
31	...	...	166.2	82.0	157.2	82.7	...

Statement showing the Solar Radiation and Grass Radiation Thermometers for the Month of June.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar	Grass.	Solar.	Grass.	
1	...	...	161.0	69.9	154.3	80.2	...
2	...	...	164.7	77.8	159.9	78.8	...
3	...	...	161.1	72.0	151.3	82.8	...
4	...	...	159.2	69.0	152.5	82.6	...
5	...	...	159.6	75.0	150.5	81.3	...
6	...	...	173.2	75.0	149.4	78.3	...
7	...	...	170.8	73.4	148.4	78.4	...
8	...	...	174.0	78.2	149.0	79.2	...
9	...	...	175.0	75.9	148.9	82.2	...
10	...	...	177.0	88.0	147.2	78.9	...
11	...	...	163.3	84.5	147.4	87.0	...
12	...	...	162.0	81.9	158.2	85.0	...
13	...	...	164.5	84.7	153.7	79.5	...
14	...	...	...	82.5	159.0	83.8	Not observed.
15	...	...	158.0	82.5	153.1	82.5	...
16	...	...	158.8	73.2	152.8	87.0	...
17	...	...	...	71.8	155.5	84.1	Not observed.
18	...	...	162.0	80.8	159.5	84.0	...
19	...	...	167.5	81.2	152.5	83.2	...
20	...	...	163.7	83.9	150.8	82.0	...
21	...	...	161.8	84.8	150.5	80.8	...
22	...	...	161.8	84.9	149.6	79.2	...
23	...	...	156.0	80.5	144.8	80.7	...
24	...	...	...	78.8	144.0	81.0	Not observed.
25	...	...	159.6	78.8	144.3	82.0	...
26	...	...	155.8	83.3	145.3	80.0	...
27	...	...	157.1	82.7	144.6	82.1	...
28	..	...	158.4	79.0	145.0	83.0	...
29	...	...	157.8	77.3	146.0	80.6	...
30	...	...	156.8	77.0	150.8	81.7	...

Statement showing the Solar Radiation and Grass Radiation Thermometer for the Month of July.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	...	...	158.2	78.6	150.5	82.0	...
2	...	...	158.2	78.7	149.0	82.3	...
3	...	...	156.9	79.5	150.3	83.8	...
4	...	...	157.6	79.2	151.2	83.5	...
5	...	...	160.3	80.3	148.3	75.7	...
6	...	...	158.0	82.5	152.5	82.3	..
7	...	...	165.4	82.8	156.3	79.5	...
8	...	..	164.8	80.6	150.9	75.0	..
9	...	...	168.0	80.2	147.0	77.2	...
10	...	...	...	80.0	144.0	80.5	Not observed
11	...	...	169.2	73.0	146.5	79.3	...
12	...	...	154.9	77.4	138.9	79.0	...
13	...	...	149.9	76.1	137.6	78.5	...
14	...	...	152.5	76.8	150.3	81.0	...
15	...	...	147.6	77.0	153.4	75.3	...
16	...	...	153.7	77.3	144.1	77.0	...
17	...	...	156.6	75.6	142.3	76.8	...
18	...	...	157.5	79.3	146.5	78.3	...
19	...	...	148.9	75.7	152.3	75.6	...
20	...	...	143.2	74.3	107.5	73.4	...
21	...	...	165.0	77.0	133.5	73.9	...
22	...	...	161.5	78.1	148.0	74.5	...
23	...	...	154.0	77.2	148.3	76.0	...
24	...	...	145.9	73.1	147.3	76.3	...
25	...	...	157.8	77.6	148.2	75.0	...
26	...	...	155.3	75.6	153.7	77.3	...
27	...	...	153.2	73.1	149.3	80.1	...
28	...	...	166.0	77.1	153.9	78.3	...
29	...	...	164.7	77.2	156.7	77.8	...
30	...	...	160.0	80.0	167.0	75.0	...
31	...	...	161.4	79.1	149.1	77.6	...

Statement showing the Solar Radiation and Grass Radiation Thermometer for the Month of August.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	...	...	161.0	78.3	148.0	76.8	...
2	...	...	155.0	79.9	148.9	76.9	...
3	...	...	155.1	80.0	139.2	77.3	...
4	...	...	157.0	78.0	145.3	77.7	...
5	...	...	155.7	78.4	144.5	76.2	...
6	...	...	154.4	81.9	146.0	74.8	...
7	...	...	159.6	78.5	142.0	69.8	...
8	...	...	161.0	78.9	143.8	76.7	...
9	...	...	164.0	76.5	144.0	77.0	...
10	...	...	...	76.2	144.3	74.0	Not observed
11	...	...	156.0	76.9	150.0	74.9	...
12	...	...	160.8	76.0	143.9	72.8	...
13	...	...	161.8	76.3	144.5	70.5	...
14	...	...	162.3	77.9	144.3	71.9	...
15	...	...	...	74.2	144.0	71.3	Not observed
16	...	...	154.0	76.0	145.6	71.0	...
17	...	...	167.8	76.5	143.8	71.5	...
18	...	...	83.6	75.5	144.0	70.4	...
19	...	...	137.9	73.4	145.3	80.0	...
20	...	...	155.8	76.0	150.5	74.5	...
21	..	...	146.7	73.3	136.9	76.2	...
22	...	...	136.4	75.2	143.8	75.4	...
23	...	...	...	73.5	147.9	80.0	Not observed
24	...	...	150.0	70.8	144.0	80.5	...
25	...	...	153.0	73.0	148.0	76.3	...
26	...	...	152.8	71.3	142.9	77.5	...
27	...	...	154.2	76.5	144.0	78.9	...
28	...	...	157.4	78.3	144.8	74.0	...
29	...	...	157.3	74.5	143.5	73.9	...
30	...	...	158.9	78.5	143.9	74.6	...
31	...	...	160.0	77.0	144.8	76.1	...

Statement showing the Solar Radiation and Grass Radiation Thermometer for the Month of September.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	...	...	161.5	78.5	148.0	76.0	...
2	...	...	151.8	74.9	134.5	73.9	...
3	...	...	150.7	73.5	142.9	73.0	...
4	...	...	154.8	72.2	144.0	73.2	...
5	...	...	153.0	74.0	144.3	75.0	...
6	...	...	147.6	70.7	137.5	73.6	...
7	...	...	147.1	70.2	142.8	68.5	...
8	...	...	155.6	69.0	140.3	66.9	...
9	...	...	153.6	67.8	141.5	70.5	...
10	...	...	162.3	76.0	142.0	73.4	...
11	...	...	162.0	69.8	143.0	73.2	...
12	...	...	156.8	77.9	146.5	73.9	...
13	...	...	160.1	73.8	142.0	70.9	...
14	...	...	142.0	74.0	137.8	72.8	...
15	...	...	147.8	75.0	145.0	71.5	...
16	...	...	137.1	73.0	142.0	72.6	...
17	..	...	154.0	71.4	140.0	73.0	...
18	...	...	154.7	72.0	135.8	68.0	...
19	...	...	155.0	75.3	145.0	66.1	...
20	...	...	154.0	72.0	136.9	60.0	...
21	...	...	149.2	71.0	134.8	64.2	...
22	...	...	153.6	72.0	136.9	63.9	...
23	...	...	151.8	69.0	137.2	62.0	...
24	...	...	154.0	77.8	137.8	67.0	...
25	...	...	155.8	75.5	140.0	65.1	...
26	...	...	156.3	73.6	146.5	67.2	...
27	...	...	154.2	74.9	142.3	60.0	...
28	...	...	151.0	69.0	143.0	64.0	...
29	...	...	149.2	70.7	141.5	63.2	...
30	...	...	149.9	72.2	141.7	60.4	...

Statement showing the Solar Radiation and Grass Radiation Thermometer for the Month of October.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	...	...	156.9	72.0	143.6	56.0	...
2	...	...	158.7	68.8	143.9	62.3	...
3	...	...	147.3	70.2	143.0	60.0	...
4	...	...	153.7	62.6	144.9	...	Not observed.
5	...	...	151.6	62.9	146.0	55.9	...
6	...	...	149.8	66.8	143.8	56.0	...
7	...	...	148.9	67.1	143.9	56.5	..
8	...	...	152.9	68.3	145.8	55.6	...
9	...	...	141.5	63.0	146.3	52.9	...
10	...	...	136.8	62.3	146.0	51.0	...
11	...	...	143.0	59.0	145.1	53.9	...
12	...	...	152.6	56.0	143.0	56.2	...
13	...	...	148.0	58.0	142.0	55.0	..
14	152.0	49.9	148.3	57.9	141.8	52.3	...
15	153.2	51.2	157.8	57.9	143.5	60.0	...
16	151.0	57.0	149.5	55.6	142.7	53.8	...
17	150.2	57.0	149.0	50.0	139.0	64.0	...
18	151.0	56.0	149.3	45.5	138.2	60.3	...
19	150.7	51.8	148.1	45.6	138.9	55.0	...
20	151.0	50.1	148.2	42.0	140.7	65.0	...
21	149.0	54.0	148.3	43.9	142.0	54.2	...
22	151.7	60.0	147.5	44.0	140.3	52.9	...
23	147.1	57.6	147.3	40.2	140.8	54.8	...
24	147.8	61.8	145.6	43.2	138.2	53.0	...
25	154.0	56.4	143.0	42.0	140.1	50.9	...
26	149.0	54.0	136.2	54.5	135.0	45.3	...
27	150.0	52.0	...	48.9	136.2	42.8	Not observed.
28	148.5	54.4	...	47.0	136.5	40.0	Do.
29	146.3	51.2	145.9	47.1	136.7	44.0	...
30	144.2	49.4	152.5	49.0	137.0	45.9	...
31	144.5	48.0	144.2	48.2	136.9	48.3	...

Statement showing the Solar Radiation and Grass Radiation Thermometer for the Month of November.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	144.0	55.0	145.7	48.8	138.0	53.8	...
2	143.5	58.6	143.2	53.7	136.0	55.2	...
3	142.8	44.1	142.0	59.0	135.9	40.3	...
4	142.8	44.4	142.9	47.8	133.8	44.2	...
5	144.0	47.0	142.7	46.0	129.0	46.5	...
6	146.0	46.6	141.6	47.2	127.5	53.0	...
7	86.0	50.7	140.0	45.2	127.8	44.5	...
8	142.2	63.0	140.3	46.5	125.0	46.0	...
9	132.9	58.0	141.5	44.9	125.7	45.0	...
10	143.2	61.6	140.6	43.3	127.9	57.8	...
11	113.0	58.2	138.4	44.0	132.0	54.5	...
12	144.0	61.0	143.0	45.1	130.8	51.9	...
13	135.0	56.8	139.2	48.0	131.5	38.9	...
14	142.5	61.2	...	45.3	131.3	50.0	Not observed.
15	129.6	51.3	140.2	...	132.5	55.7	Do.
16	135.3	50.9	141.5	45.0	131.9	44.0	...
17	80.8	54.0	141.7	43.9	132.8	49.3	...
18	134.0	56.2	...	39.8	133.0	53.5	Not observed.
19	134.8	55.3	130.5	40.0	130.0	39.0	...
20	79.0	59.0	...	43.7	128.5	40.3	Not observed.
21	83.9	54.1	...	42.0	131.9	41.7	Do.
22	62.0	56.0	...	41.1	131.6	43.5	Do.
23	64.0	44.0	...	43.5	128.8	48.0	Do.
24	83.0	44.6	126.5	39.0	128.5	48.3	...
25	106.6	43.1	124.2	41.0	127.6	57.1	...
26	71.0	53.1	124.9	40.0	127.8	44.0	...
27	78.0	47.3	124.8	38.2	130.0	41.8	...
28	133.4	54.8	123.0	41.8	126.5	44.9	...
29	78.8	49.1	123.8	41.0	124.3	40.5	...
30	99.6	52.8	123.0	36.0	128.2	39.4	...

Statement showing the Solar Radiation and Grass Radiation Thermometer for the Month of December.

Date.	1896.		1897.		1898.		Remarks.
	Solar.	Grass.	Solar.	Grass.	Solar.	Grass.	
1	106.5	43.4	123.9	38.1	126.3	42.1	...
2	127.0	32.6	126.7	37.5	126.8	39.5	...
3	...	33.6	126.5	39.2	...	40.3	Not observed.
4	...	36.8	123.5	38.9	124.5	37.2	Do.
5	...	36.2	122.9	42.7	120.7	40.9	Do.
6	...	40.5	123.8	44.5	105.0	44.6	Do.
7	...	39.1	125.2	45.8	97.9	52.3	Do.
8	...	44.5	124.5	42.7	76.8	56.5	Do.
9	...	36.7	122.9	42.0	100.3	54.0	Do.
10	...	35.3	121.9	...	115.4	43.8	Do.
11	...	35.7	122.0	45.4	116.2	58.8	Do.
12	...	35.7	121.9	41.8	110.9	46.8	Do.
13	...	34.8	114.2	41.2	117.2	42.4	Do.
14	...	39.3	110.9	33.5	115.0	33.8	Do.
15	...	36.9	114.1	27.0	114.9	31.0	Do.
16	...	33.2	116.5	26.0	116.5	30.8	Do.
17	...	42.2	116.3	30.0	120.0	37.6	Do.
18	...	33.6	119.5	32.3	122.4	35.0	Do.
19	...	37.3	122.0	36.1	128.7	47.5	Do.
20	...	37.5	121.2	37.8	117.8	46.6	Do.
21	131.1	35.7	124.1	35.6	121.0	34.5	...
22	131.8	37.9	122.9	47.4	113.0	38.9	...
23	130.2	30.6	121.5	36.3	116.4	42.0	...
24	130.7	45.0	122.6	44.5	114.5	44.8	...
25	127.8	24.7	121.0	41.0	119.2	46.0	...
26	127.5	39.2	117.0	43.2	131.7	37.4	...
27	127.9	43.5	118.5	38.0	116.8	36.0	...
28	110.5	43.8	122.9	36.5	114.9	36.8	...
29	122.7	35.0	119.7	38.0	116.1	42.7	...
30	126.1	33.8	119.5	41.0	121.0	46.5	...
31	121.0	29.8	119.1	36.5	114.6	32.6	...

Statement showing the Barometric Pressure at 8 A.M. *Local*

Date.	October 1896.	November 1896.	December 1896.	January 1897.	February 1897.	March 1897.
1	...	29.376	29.398	29.504	29.308	29.236
2	...	29.396	29.364	29.446	29.350	29.450
3	...	29.382	29.362	29.494	29.360	29.364
4	...	29.380	29.374	29.472	29.330	29.140
5	...	29.314	29.408	29.392	29.320	29.230
6	...	29.280	29.460	29.396	29.336	29.230
7	...	29.330	29.468	29.416	29.368	29.120
8	...	29.350	29.436	29.358	29.370	29.106
9	...	29.334	29.390	29.326	29.388	29.170
10	29.278	29.332	29.434	29.266	29.270	29.306
11	29.278	29.320	29.444	29.270	29.178	29.336
12	29.316	29.280	29.426	29.264	29.280	29.290
13	29.320	29.292	29.470	29.240	29.388	29.290
14	29.324	29.320	29.464	29.112	29.330	29.308
15	29.304	29.316	29.420	29.336	29.312	29.316
16	29.326	29.320	29.436	29.420	29.300	29.312
17	29.308	29.338	29.392	29.422	29.346	29.256
18	29.328	29.344	29.330	29.288	29.278	29.290
19	29.336	29.378	29.416	29.332	29.286	29.198
20	29.338	29.320	29.422	29.426	29.248	29.110
21	29.334	29.254	29.416	29.478	29.296	29.104
22	29.320	29.190	29.404	29.534	29.320	29.128
23	29.316	29.250	29.372	29.470	29.208	29.198
24	29.346	29.322	29.368	29.370	29.168	29.266
25	29.394	29.392	29.478	29.340	29.354	29.250
26	29.398	29.324	29.546	29.368	29.330	29.140
27	29.364	29.316	29.426	29.340	29.228	29.050
28	29.360	29.316	29.284	29.352	29.190	29.100
29	29.356	29.456	29.410	29.284	...	29.296
30	29.348	29.494	29.378	29.280	...	29.252
31	29.348	...	29.440	29.218	...	29.164

Time, from 10th October 1896 to 30th September 1897.

April 1897.	May 1897.	June 1897.	July 1897.	August 1897.	September 1897.	Remarks.
29.210	29.102	29.050	28.996	28.852	29.070	...
29.208	29.100	29.066	29.068	28.950	29.004	...
29.168	29.096	29.020	29.020	28.960	29.044	...
29.264	29.036	29.024	28.938	28.896	29.004	...
29.254	29.014	29.080	28.934	28.864	29.006	...
29.306	29.032	29.072	28.968	28.860	29.140	...
29.296	29.044	29.002	28.948	28.880	29.140	...
29.260	29.116	29.000	28.920	28.888	29.130	...
29.192	29.140	28.992	28.832	28.892	29.148	...
29.174	29.094	29.110	28.864	28.898	29.128	...
29.260	29.100	29.050	28.804	28.934	29.108	...
29.254	29.020	28.930	28.790	28.946	29.128	...
29.246	29.080	28.820	28.820	28.914	29.138	...
29.200	29.090	28.866	28.828	28.896	29.130	...
29.224	29.106	28.880	28.880	28.924	29.098	...
29.244	29.046	28.900	28.952	28.540	29.058	...
29.220	29.004	28.916	28.934	28.920	29.070	...
29.198	29.000	28.916	28.826	28.940	29.144	...
29.200	29.016	28.870	28.850	28.946	29.128	...
29.160	29.040	28.868	28.906	28.946	29.160	...
29.210	29.034	28.818	28.936	28.972	29.160	...
29.204	29.030	28.776	28.978	28.940	29.170	...
29.170	29.048	28.828	28.990	28.988	29.198	...
29.200	29.070	28.896	28.976	29.038	29.208	...
29.274	29.100	28.916	28.976	29.012	29.136	...
29.156	29.144	29.006	28.936	29.010	29.090	...
29.232	29.118	29.026	28.930	29.048	29.220	...
29.328	29.076	29.000	28.920	29.028	29.220	...
29.210	29.046	28.990	28.894	29.040	29.200	...
29.126	29.050	28.936	28.856	29.120	29.230	...
...	29.036	...	28.808	29.130	...	...

Statement showing the Barometric Pressure at 8 A.M. *Local*

Date.	October 1897.	November 1897.	December 1897.	January 1898.	February 1898.	March 1898.	April 1898.
1	29.204	29.366	29.288	28.388	28.218	29.212	29.126
2	29.190	29.240	29.316	29.378	29.234	29.294	29.200
3	29.150	29.280	29.312	29.260	29.220	29.454	29.238
4	29.126	29.380	29.332	29.396	29.110	29.360	29.204
5	29.106	29.400	29.408	29.468	29.128	29.340	29.160
6	29.192	29.384	29.502	29.450	29.250	29.310	29.100
7	29.204	29.350	29.434	29.390	29.260	29.316	29.244
8	29.182	29.376	29.368	29.354	29.204	29.270	29.250
9	29.234	29.340	29.356	29.428	29.090	29.272	29.200
10	29.276	29.312	29.390	29.476	29.020	29.340	29.184
11	29.316	29.262	29.296	29.472	29.174	29.290	29.128
12	29.270	29.250	29.384	29.394	29.314	29.294	29.150
13	29.200	29.238	29.344	29.360	29.238	29.270	29.224
14	29.214	29.284	29.478	29.354	29.152	29.254	29.272
15	29.236	29.344	29.446	29.376	29.198	29.220	29.204
16	29.280	29.334	29.378	29.400	29.180	29.242	29.150
17	29.280	29.354	29.366	29.406	29.180	29.240	29.058
18	29.276	29.376	29.388	29.444	29.110	29.250	29.090
19	29.266	29.364	29.422	29.440	29.160	29.226	29.150
20	29.324	29.364	29.436	29.438	29.086	29.266	29.170
21	29.318	29.350	29.392	29.392	29.144	29.282	29.194
22	29.264	29.352	29.406	29.372	29.290	29.196	29.112
23	29.224	29.382	29.418	29.380	29.450	29.256	29.156
24	29.206	29.384	29.460	29.310	29.352	29.256	29.192
25	29.210	29.424	29.474	29.388	29.320	29.232	29.136
26	29.276	29.400	29.442	29.366	29.312	29.188	29.070
27	29.384	29.366	29.382	29.332	29.310	29.216	29.090
28	29.356	29.396	29.378	29.370	29.314	29.210	29.134
29	29.284	29.368	29.436	29.410	...	29.226	29.164
30	29.360	29.290	29.500	29.282	...	29.260	29.138
31	29.392	...	29.464	29.200	...	29.206	...

Time, from 1st October 1897 to 30th November 1898.

May 1898.	June 1898.	July 1898.	August 1898.	September 1898.	October 1898.	November 1898.	Remarks.
29.076	29.090	28.936	28.900	29.068	29.204	29.260	...
29.000	29.130	28.936	28.900	29.082	29.224	29.190	...
29.006	29.118	28.932	28.950	29.094	29.250	29.202	...
29.056	28.990	28.934	28.926	29.060	29.192	29.278	...
29.032	28.964	28.920	28.890	29.030	29.204	29.364	...
29.000	28.950	28.848	28.870	29.030	29.204	29.364	...
29.020	28.966	28.830	28.880	29.040	29.220	29.384	...
29.000	28.978	28.900	28.890	29.080	29.220	29.354	...
28.964	28.948	28.928	28.922	29.080	29.266	29.346	...
29.010	28.920	28.884	28.926	29.070	29.270	29.340	...
29.026	28.894	28.908	28.950	29.040	29.244	29.316	...
29.028	28.896	28.926	28.940	29.042	29.230	29.280	...
29.124	28.938	28.906	28.940	29.024	29.170	29.224	...
29.222	28.840	28.896	28.980	29.050	29.214	29.204	...
29.206	28.868	28.960	29.020	29.040	29.240	29.296	...
29.128	28.850	28.914	29.042	29.052	29.224	29.320	...
29.070	28.806	28.856	29.070	29.090	29.160	29.304	...
29.110	28.840	28.928	29.100	29.136	29.236	29.324	...
29.216	28.876	28.890	29.082	29.124	29.324	29.348	...
29.200	28.900	28.850	29.056	29.104	29.318	29.352	...
29.106	28.886	28.942	29.076	29.166	29.310	29.318	...
29.108	28.916	28.910	29.060	29.174	29.288	29.250	...
29.128	28.870	28.940	29.040	29.184	29.288	29.224	...
29.118	28.936	28.962	29.054	29.200	29.310	29.232	...
29.088	28.970	28.940	28.968	29.240	29.328	29.322	...
29.092	29.062	28.928	28.984	29.244	29.300	29.356	...
29.132	29.100	28.894	29.100	29.180	29.334	29.404	...
29.136	28.982	28.880	29.090	29.230	29.312	29.460	...
29.072	28.894	28.890	29.100	29.240	29.278	29.446	...
28.972	28.966	28.854	29.070	29.230	29.240	29.460	...
29.000	...	28.888	29.080	...	29.246	...	...

Rainfall of 1891

Months.	Jodhpore.		Pali.		Phalodi.		Didwana.		Pachbhadra.		Sambhar.		Nagore.		Mallani.		Sojat.		Bilara.		Jaitaran.		Nawa.	
	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.
Jan. .	...	33	...	17	...	29	...	26	...	35	...	97	...	32	...	37	...	...	...	81	...	...	...	37
Feb. .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	85	...	...
March	...	21	...	46	...	10	...	61	...	28	...	66	...	57	...	42	1	15	...	25	...	44	...	29
April.	...	...	...	...	...	...	...	...	...	...	...	4	...	15	...	...	...	...	...	...	...	...	...	..
May .	...	74	...	54	...	43	1	37	...	97	...	25	2	63	...	...	...	...	...	...	...	...	...	31
June .	...	.	...	...	...	9	...	35	...	...	...	70	...	18	...	...	...	...	...	...	...	...	...	1
July .	5	81	9	25	9	78	3	7	7	15	3	83	3	53	4	13	9	83	4	96	2	94	1	31
Aug. .	...	85	...	31	...	7	2	93	...	76	3	79	1	23	...	23	...	8	...	19	...	37	2	14
Sept. .	...	35	...	34	...	30	1	58	...	46	2	10	...	52	...	86	1	20	...	30	...	30	3	24
Oct. .	...	4	...	...	...	...	...	6	...	...	...	33	...	...	...	...	...	...	...	...	...	...	...	16
Nov. .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dec. .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	8.33		11.07		11.06		10.23		9.97		12.67		9.13		6.01		12.26		6.51		4.90		7.83	

Average for whole

Rainfall of 1892

Months.	Jodhpore.		Pali.		Phalodi.		Didwana.		Pachbhadra.		Sambhar.		Nagore.		Mallani.		Sojat.		Bilara.		Jaitaran.		Nawa.	
	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.
Jan. .	...	27	...	52	...	9	...	53	...	39	...	83	...	77	...	13	...	80	1	35	...	35	...	22
Feb. .	...	...	...	...	...	8	...	8	...	...	...	2	...	5	...	...	...	...	...	...	...	...	...	...
March	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
April.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
May .	...	93	...	...	1	25	...	27	2	1	...	60	...	38	2	23	...	20	...	28	...	...	...	63
June .	...	61	...	50	2	63	1	64	1	3	1	69	2	19	...	74	...	68	...	22	1	79	...	...
July .	4	54	2	62	2	88	5	69	3	41	10	50	5	4	5	14	5	13	7	56	5	98	7	32
Aug. .	8	14	6	74	3	33	6	5	8	61	12	24	3	57	5	47	7	20	9	83	9	99	11	60
Sept. .	4	27	7	16	2	...	4	35	2	15	13	98	3	72	5	90	12	41	6	18	6	16	8	23
Oct. .	...	...	...	...	...	...	...	38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17
Nov. .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dec. .	...	29	...	...	1	15	...	...	...	38	...	9	1	80	...	24	...	...	...	...	...	...	...	...
Total	19.05		17.54		13.41		18.99		17.98		39.95		17.52		19.85		26.42		25.42		24.27		28.17	

Average for whole

for Marwar.

Marothe.		Parbatsar.		Bali.		Jaswant-pura.		Shergarh.		Siwana.		Sheo.		Sankra.		Merta.		Jalore.		Sanchore.		Total.	Months.
Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.		
...	...	...	...	...	...	...	50	...	...	...	...	...	...	...	...	...	50	...	...	...	...	5.24	Jan.
...	...	...	...	...	...	...	...	...	...	...	...	...	80	...	...	...	...	...	...	...	...	1.65	Feb.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16	...	...	...	...	...	...	5.73	March.
...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.29	April.
...	87	1	20	...	10	...	2	...	6	...	...	...	12	...	19	...	50	...	...	...	...	10.30	May.
...	66	...	...	...	15	...	...	...	...	...	...	...	...	...	...	...	...	...	24	...	...	2.38	June.
4	48	5	32	11	62	14	64	8	71	9	76	9	98	4	36	3	1	8	48	2	20	148.15	July.
3	24	2	45	...	30	...	50	...	12	...	60	...	90	...	...	...	85	...	23	...	...	22.14	Aug.
4	46	2	52	...	66	...	51	...	12	...	15	...	...	...	30	...	25	...	...	...	56	21.08	Sept.
...	34	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	.93	Oct.
...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Nov.
...	...	...	93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.93	Dec.
14.05		12.42		12.93		16.17		9.01		10.51		11.80		5.01		5.24		8.95		2.76		218.82	Total.

State, 9.51 *inches.*

for Marwar.

Marothe.		Parbatsar.		Bali.		Jaswant-pura.		Shergarh.		Siwana.		Sheo.		Sankra.		Merta.		Jalore.		Sanchore.		Total.	Months.
Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.		
...	43	...	81	...	55	...	24	...	30	...	37	...	57	...	18	...	53	...	14	...	...	10.37	Jan.
...	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.32	Feb.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	March.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	April.
...	55	..	45	1	...	...	55	1	55	2	42	...	...	...	80	...	...	...	65	1	25	18.00	May.
1	62	...	34	...	54	1	14	1	31	...	8	...	...	1	85	...	95	...	53	...	...	22.08	June.
10	92	11	17	6	12	5	36	2	45	3	35	2	96	3	8	10	23	5	31	13	20	139.96	July.
11	16	8	59	15	87	17	19	4	65	4	89	8	13	3	27	8	88	9	60	3	25	188.25	Aug.
9	83	7	8	12	67	16	10	1	40	2	48	...	35	1	...	10	30	4	6	4	48	146.26	Sept.
...	30	...	...	...	12	2	50	...	...	...	8	...	...	...	...	...	...	...	43	...	90	4.88	Oct.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Nov.
...	...	...	...	...	30	...	35	...	68	1	5	...	59	1	59	...	...	...	16	...	...	8.67	Dec.
34.81		28.44		37.26		43.43		12.34		14.72		12.60		11.77		30.89		20.88		23.08		538.79	Total.

State, 23.43 *inches.*

Rainfall of 1893

Months.	Jodhpore.		Pali.		Phalodi.		Didwana.		Pachbhadra.		Sambhar.		Nagore.		Mallani.		Sojat.		Bilara.		Jaitaran.		Nawa.	
	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.
Jan. .	1	41½	...	...	...	30	1	49	...	55	...	83	...	96	...	46	...	10	...	76	...	...	1	...
Feb. .	...	17	...	...	...	...	...	52	...	25	...	54	...	53	...	18	...	16	...	33	...	...	...	...
March	...	12	...	...	...	...	...	64	...	...	...	31	...	64	...	...	...	...	...	26	...	45	...	...
April .	...	6	...	...	...	2	...	...	...	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...
May .	...	90	1	13	...	10	1	94	1	40	2	22	...	93	...	42	...	24	1	61	...	57	...	...
June .	2	45	4	15	1	30	1	67	6	36	2	34	4	11	5	19	3	69	5	37	6	33	2	11
July .	7	31	2	7	6	22	5	86	12	65	10	27	4	76	6	35	5	68	5	72	6	62	6	84
Aug. .	8	20½	2	76	1	47	5	4	5	60	6	65	4	52	2	90	2	42	6	36	5	32	6	9
Sept. .	8	39	4	70	1	...	3	99	17	51	3	83	2	93	10	75	1	5	4	21	2	20	1	61
Oct. .	...	...	...	24	...	...	...	...	...	...	...	2	...	...	...	10	...	...	...	...	...	...	...	...
Nov. .	1	92	2	40	...	...	1	7	1	32	1	75	...	90	1	40	...	90	2	10	2	2	1	83
Dec. .	...	25	...	...	...	66	1	28	...	...	...	12	...	25	...	...	...	...	...	...	...	...	...	5
Total	31.19		17.45		11.07		23.50		45.75		28.88		20.53		27.75		14.24		26.72		23.51		19.53	

Average for whole

Rainfall of 1894

Months.	Jodhpore.		Pali.		Phalodi.		Didwana.		Pachbhadra.		Sambhar.		Nagore.		Mallani.		Sojat.		Bilara.		Jaitaran.		Nawa	
	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.
Jan. .	...	28	...	22	...	70	...	66	...	86	...	48	1	10	...	10	...	7	...	34	...	...	...	66
Feb. .	...	9	...	...	...	10	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	..
March	...	10	...	43	...	52	...	35	...	25	...	...	...	27	...	...	...	...	...	...	...	...	...	...
April .	...	...	...	...	...	...	...	12	...	15	...	...	...	5	...	5	...	...	...	15	...	...	...	...
May .	...	...	...	...	...	5	...	28	...	...	1	75	...	31	1	...	...	...	...	...	...	...	...	...
June .	6	86	6	42	...	68	2	34	4	83	3	63	3	46	2	75	6	65	7	23	6	70	2	11
July .	5	49	9	61	4	25	4	24	10	30	8	2	6	81	1	18	13	35	10	57	7	7	4	66
Aug. .	1	43	4	1	...	92	4	69	2	90	6	13	3	20	1	80	...	83	1	85	2	52	4	43
Sept. .	1	83	1	54	...	30	1	73	2	47	2	97	1	35	1	40	3	39	1	74	4	91	3	23
Oct. .	...	...	...	49	...	...	...	...	...	...	...	...	...	...	...	25	...	...	...	15	...	...	...	...
Nov. .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dec. .	...	47	...	96	...	...	...	88	...	77	3	64	1	39	...	6	...	70	1	24	...	64	2	53
Total	16.55		23.68		7.52		15.29		22.53		26.62		17.94		8.69		24.99		23.27		21.84		17.62	

Average for whole

for Marwar.

Marothe.		Parbatsar.		Bali.		Jaswant-pura.		Shergarh.		Siwana.		Sheo.		Sankra.		Merta.		Jalore.		Sanchore.		Total.	Months.
Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.		
1	12	1	5	...	10	...	...	...	90	...	46	...	55	1	8	...	40	..	...	...	...	13.52½	Jan.
...	52	...	57	...	80	...	40	...	...	...	...	...	...	...	...	...	74	...	81	...	...	6.52	Feb.
...	...	...	...	...	44	...	...	...	...	...	...	...	...	...	...	...	61	...	10	...	...	3.57	March
...	...	...	...	...	...	...	...	...	25	...	...	...	...	...	...	...	...	...	...	...	...	.44	April.
2	91	...	76	1	48	...	7	...	74	1	97	...	12	...	10	1	...	...	32	...	...	20.93	May.
1	5	2	8	10	87	9	44	3	62	1	96	2	58	4	22	3	54	3	90	5	53	93.86	June.
6	16	4	13	7	94	14	55	8	22	5	55	7	86	...	50	7	43	10	2	7	98	160.69	July.
3	38	2	72	5	33	1	15	5	76	1	5	4	...	3	80	5	25	1	40	1	10	92.27½	Aug.
2	...	...	60	5	92	23	31	5	24	7	35	1	33	1	10	3	...	11	95	38	96	162.93	Sept.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.36	Oct.
2	25	...	...	1	83	3	30	...	80	3	65	...	41	...	...	...	45	3	17	2	...	35.47	Nov.
...	...	...	21	...	36	...	50	...	45	...	10	...	...	...	40	...	...	...	29	...	...	4.92	Dec.
19.39		12.12		35.07		52.72		25.98		22.09		16.85		11.20		22.42		31.96		55.57		595.49	Total.

State, 25.89 *inches.*

for Marwar.

Marothe.		Parbatsar.		Bali.		Jaswant-pura.		Shergarh.		Siwana.		Sheo.		Sankra.		Merta.		Jalore.		Sanchore.		Total.	Months
Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.		
...	76	...	...	...	...	...	...	...	14	...	...	...	23	...	33	...	...	...	...	...	...	6.93	Jan.
...	...	...	...	...	...	...	...	...	22	...	...	...	32	...	...	...	...	...	...	...	...	.83	Feb.
..	...	...	...	...	20	...	...	...	...	...	37	...	...	...	..	...	22	...	...	...	10	2.81	March.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.52	April.
...	37	...	...	...	...	...	...	...	...	...	...	...	...	...	22	...	...	...	...	...	...	3.98	May.
2	35	2	62	4	49	4	59	2	89	4	90	1	96	...	41	2	10	2	98	4	32	87.27	June.
3	98	2	30	5	18	10	92	6	33	3	50	1	34	1	70	1	84	7	8	4	10	133.82	July.
6	46	3	39	1	26	1	15	3	80	1	45	3	25	3	12	...	82	4	65	1	31	65.37	Aug.
3	57	2	60	4	49	1	70	1	45	1	44	1	41	2	30	1	53	1	59	6	2	54.96	Sept.
...	...	...	...	...	...	...	4	...	...	...	...	...	..	...	...	...	...	...	...	...	...	.93	Oct.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Nov.
3	22	1	65	...	69	...	26	...	...	...	...	...	...	...	...	1	95	...	29	...	...	21.34	Dec.
20.71		12.56		16.31		18.66		14.83		11.66		8.51		8.08		8.46		61.59		15.85		378.76	Total.

State, 16.47 *inches.*

Rainfall of 1895

Months.	Jodhpore.		Pali.		Phalodi.		Didwana.		Pachbhadra.		Sambhar.		Nagore.		Mallani.		Sojat.		Bilara.		Jaitaran.		Nawa.	
	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.
Jan. .	...	35	...	...	...	23	1	53	...	80	...	67	...	63	...	12	...	...	...	9	...	...	...	50
Feb. .	...	...	...	...	...	...	...	7	...	...	...	6	...	4	...	...	..	...	...	...	...	...	...	...
Mar. .	...	35	...	63	...	20	...	84	...	75	...	35	...	25	...	20	...	...	...	50	...	45	...	...
April .	...	...	...	...	...	...	...	6	...	...	...	57	...	23	...	...	...	...	...	...	...	36	...	...
May .	...	31	...	...	...	20	...	...	...	15	...	6	...	21	...	5	...	...	...	...	...	...	...	...
June .	...	4	...	38	1	9	...	60	2	32	1	27	1	83	2	20	1	20	...	45	...	64	...	...
July .	4	27	4	17	...	89	5	63	1	30	4	87	1	20	4	33	4	5	6	6	4	9	3	7
Aug. .	7	26	2	23	2	3	8	98	5	86	8	30	7	65	2	73	1	40	5	55	2	90	5	65
Sept. .	...	10	...	32	...	...	...	...	...	...	...	34	...	29	...	...	...	...	...	7	...	...	...	...
Oct. .	...	...	...	...	...	...	...	...	...	56	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Nov. .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dec. .	...	...	...	...	...	...	...	4	...	...	...	10	...	7	...	..	...	...	...	...	...	...	...	...
Total	12.68		7.73		4.64		17.75		11.74		16.59		12.40		9.63		6.65		12.72		8.44		9.22	

Average for whole

Rainfall of 1896

Months.	Jodhpore.		Pali.		Phalodi.		Didwana.		Pachbhadra.		Sambhar.		Nagore.		Mallani.		Sojat.		Bilara.		Jaitaran.		Nawa.	
	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.
Jan. .	...	...	...	...	...	14	...	...	...	...	...	4	...	2	...	...	...	...	...	...	...	...	...	...
Feb. .	...	4	...	...	...	...	...	28	...	...	..	6	...	...	...	...	...	...	...	...	...	...	...	...
Mar. .	...	...	...	...	...	...	...	22	...	...	...	2	...	47	...	...	...	...	...	...	...	...	...	..
April .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
May .	...	...	...	...	...	...	...	14	...	...	...	94	...	11	...	...	...	...	...	...	...	...	...	60
June .	3	16	3	98	...	68	1	77	6	56	2	60	3	96	2	43	2	72	1	33	4	38	2	32
July .	5	20	5	59	5	51	3	72	2	75	4	74	3	64	2	43	10	26	6	36	8	93	4	49
Aug. .	4	99	7	96	1	40	2	42	4	10	2	40	...	62	5	51	5	62	2	71	...	...	1	80
Sept. .	...	...	...	...	...	...	...	26	...	...	2	95	...	5	...	...	...	...	...	...	...	...	...	49
Oct. .	...	...	...	...	...	...	...	18	...	...	...	20	...	...	...	...	...	...	...	...	...	...	...	...
Nov. .	...	80	1	41	...	...	...	70	...	25	1	17	...	32	...	45	...	30	1	40	1	40	1	50
Dec. .	...	7	...	16	...	...	...	26	...	3	...	12	...	12	...	...	...	10	...	...	...	...	...	25
Total	14.26		19.10		7.73		9.95		13.69		15.24		9.31		10.82		19.00		11.80		14.71		11.45	

Average for whole

for Marwar.

Marothe.		Parlatsar.		Bali.		Jaswant-pura.		Shergarh.		Siwana.		Sheo.		Sankra.		Merta.		Jalore.		Sanchore.		Total.	Months.
Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.		
...	50	...	...	...	...	...	...	...	12	...	...	...	...	...	7	...	...	...	...	...	...	5.61	Jan.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.17	Feb.
...	...	...	...	...	82	...	30	...	25	...	40	...	29	...	...	...	26	...	46	...	50	7.80	March.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	50	...	...	...	...	1.72	April.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30	...	...	...	...	1.42	May.
2	37	...	68	1	29	1	75	2	39	...	14	...	81	1	...	...	70	...	37	1	59	25.37	June.
5	10	4	32	3	28	3	43	1	42	3	40	...	94	...	90	4	35	1	84	4	20	76.88	July.
...	...	6	18	5	17	2	34	1	13	2	17	1	2	3	26	13	22	2	43	1	81	99.36	Aug.
...	...	...	...	...	45	...	...	...	...	...	26	...	...	...	9	...	27	...	...	...	...	1.93	Sept.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.56	Oct.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Nov.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.21	Dec.
7.97		11.18		11.01		7.82		5.31		6.37		3.06		5.32		19.60		5.10		8.10		221.03	Total.

State, 9.61 *Inches.*

for Marwar.

Marothe.		Parlatsar.		Bali.		Jaswant-pura.		Shergarh.		Siwana.		Sheo.		Sankra.		Merta.		Jalore.		Sanchore.		Total.	Months.
Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.		
...	...	..	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	.20	Jan.
...	...	...	...	..	...	...	...	...	...	..	...	...	55	...	...	...	...	..	...	...	...	.93	Feb.
...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.71	March.
...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	April.
...	91	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30	...	...	...	...	4.00	May.
2	85	1	72	6	6	5	53	1	65	3	32	1	22	...	60	1	94	4	62	4	10	69.50	June.
3	8	4	64	8	50	3	79	2	18	4	74	2	4	2	4	4	73	4	48	6	35	110.19	July.
...	...	4	60	5	73	7	54	2	34	1	33	...	45	...	...	2	39	4	14	6	...	74.05	Aug.
1	66	...	77	...	56	...	61	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7.35	Sept.
...	34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.72	Oct.
1	50	1	30	1	33	2	90	...	26	...	97	...	15	...	...	1	...	2	10	1	65	22.86	Nov.
...	80	...	...	...	...	...	12	...	5	...	...	...	..	...	...	...	14	...	14	...	...	2.36	Dec.
11.14		14.03		22.18		20.49		6.48		10.36		4.41		2.64		10.50		15.48		18.10		292.87	Total.

State, 12.73 *Inches.*

Rainfall of 1897

Months.	Jodhpore.		Pali.		Phalodi.		Didwana.		Pachbhadra.		Sambhar.		Nagore.		Mallani.		Sojat.		Bilara.		Jaitaran.		Nawa.	
	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.
Jan. .	...	30	...	...	...	19	...	11	...	13	...	12	...	15	...	...	...	...	...	...	...	...	...	...
Feb. .	...	...	...	...	...	...	...	...	...	. .	...	3	...	...	...	...	...	...	...	...	...	...	...	...
March	...	2	...	...	...	...	...	11	...	...	...	3	...	11	..	...	...	...	...	...	...	...	...	...
April.	...	15	...	...	...	...	...	11	...	5	...	15	...	30	...	...	...	...	...	...	...	...	...	30
May .	...	3	...	...	...	...	...	24	...	...	...	14	1	39	...	...	...	..	...	...	...	...	...	...
June .	...	92	...	32	...	5	2	4	...	2	...	7	...	6	...	...	...	...	...	57	...	..	...	84
July .	2	87	10	70	2	37	7	69	7	99	6	21	5	10	2	47	7	37	5	32	6	10	3	30
Aug. .	6	37	5	40	6	9	11	26	2	82	6	10	5	48	8	25	6	41	7	16	8	21	5	2
Sept. .	2	50	...	80	...	...	1	28	1	87	1	29	1	70	1	17	3	32	3	30	1	83	1	70
Oct. .	1	64	...	...	...	...	...	22	...	35	...	45	...	9	...	...	...	...	..	37	...	25	...	...
Nov. .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dec. .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	14.80		17.22		8.70		23.06		13.23		14.59		14.38		11.89		17.10		16.72		16.39		11.16	

Average for whole

for Marwar.

Marothe.		Parbatsar.		Bali.		Jaswantpura.		Shergarh.		Siwana.		Sheo.		Sankra.		Merta.		Jalore.		Sanchore.		Total.	Months.
Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.		
...	...	...	18	...	2	...	4	...	23	...	...	...	16	...	...	...	...	...	9	...	...	1.72	Jan.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.03	Feb.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.27	March.
...	41	...	...	...	...	...	2	..	...	...	...	...	...	...	...		20	...	...	...	...	1.69	April.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30	...	...	...	...	2.10	May.
...	...	...	63	...	43	...	58	...	70	...	18	...	...	...	...	...	...	1	7	...	...	8.48	June.
4	15	4	41	14	69	11	52	4	79	5	2	3	50	2	...	6	53	6	71	6	96	137.77	July.
4	27	6	8	3	91	8	92	4	12	5	19	2	84	4	96	3	98	12	80	3	69	139.33	Aug.
1	70	1	82	3	17	3	58	...	21	2	7	...	40	1	61	1	13	3	57	3	48	43.50	Sept.
...	...	1	15	...	33	1	83	...	...	...	...	...	90	...	...	2	7	...	79	...	22	10.66	Oct.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Nov.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Dec.
10.53		14.27		22.55		26.49		10.05		12.46		7.80		8.57		14.21		25.03		14.35		345.55	Total.

State, 15.02 *inches.*

Rainfall, Jodhpore City, from 1887 *to* 1898.

Month.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	Total.	Average.
January . . .	.32	.31	...	...	.39	.29	1.01	.22	.20	...	...	...	2.74	.23
February . . .	...	.65	...	...	...	...	.20	...	...	...	...	...	.85	.07
March . . .	...	...	...	.07	.15	...	...	...	...	...	...	...	.22	.02
April	.45	...	...	...	...	...	.18	...	...	...	...	...	.63	.05
May	...	...	.34	.10	.38	1.30	.64	...	...	...	...	...	2.76	.23
June	.45	...	2.41	2.47	...	.50	2.46	6.43	...	3.88	.26	.08	18.94	1.58
July	3.09	1.44	1.35	5.78	7.14	4.31	8.56	4.67	4.70	3.96	2.90	6.20	54.10	4.51
August . . .	2.65	13.99	4.29	3.36	.32	6.14	8.56	1.15	6.38	4.16	8.30	...	59.30	4.94
September . . .	...	...	.34	2.16	.46	5.28	5.70	2.45	1.28	...	2.21	2.41	22.29	1.86
October . . .	...	...	...	...	...	...	.30	...	...	...	1.97	.01	2.28	.19
November . . .	...	...	...	...	...	...	1.63	...	...	.50	...	...	2.13	.18
December . . .	...	...	...	.27	...	.71	.48	.16	...	...	...	.45	2.07	.17
Total . .	6.96	16.39	8.73	14.21	8.84	18.53	29.72	15.08	12.56	12.50	15.64	9.15	168.31	14.03

Rainfall as Recorded at Bap for Four Years, from 1894 to 1897.

Months.	1894.	1895.	1896.	1897.	Total.	Average.	Remarks.
January	...	0.22	...	0.23	0.45	0.11	...
February	...	...	...	...	...	...	...
March	...	0.31	...	...	0.31	0.08	...
April	...	...	...	0.32	0.32	0.08	...
May	...	...	...	...	...	...	...
June	...	0.84	1.73	0.02	2.59	0.65	...
July	3.68	0.58	2.54	2.27	9.07	2.27	...
August	2.13	4.35	0.50	7.18	14.16	3.54	...
September	0.16	...	...	0.98	1.14	0.28	...
October	...	...	...	..	...	...	...
November	...	...	...	...	...	...	...
December	0.02	...	0.04	...	0.06	0.01	...
Total	5.99	6.30	4.81	11.00	28.10	7.02	

Rainfall as Recorded at Devi Kote for Four Years, from 1894 to 1897.

Months.	1894.	1895.	1896.	1897.	Total.	Average.	Remarks.
January	...	0.03	...	...	0.03	0.01	...
February	...	...	...	...	...	...	...
March	...	0.50	...	...	0.50	0.12	...
April	...	...	...	0.50	0.50	0.13	...
May	...	0.55	...	...	0.55	0.14	...
June	...	0.55	2.71	...	3.26	0.82	...
July	1.59	1.32	0.80	1.30	5.01	1.25	...
August	4.19	0.15	2.99	2.95	10.28	2.57	...
September	1.61	...	..	2.44	4.05	1.01	...
October	...	...	0.06	...	0.06	0.01	...
November	...	...	...	...	...	...	...
December	...	...	...	...	...	...	...
Total	7.39	3.10	6.56	7.19	24.24	6.06	

Monthly Statements of Rainfall, Barometer, Mean Temperature, and Wind Direction for the Ten Years 1889–98 at Mount Abu.

Year.	Month.	Rainfall.	8 A.M. Barometer.	Mean Daily Temperature.	Mean Wind Direction.
1889.	Jan.	0.07	26.154	60.7	N. 29° W.
	Feb.	0.59	.131	61.5	N. 31° W.
	Mar.	0	.158	70.9	N. 27° W.
	April	0	.053	78.5	N. 50° W.
	May	4.87	.019	79.2	N. 61° W.
	June	13.70	25.860	75.6	S. 79° W.
	July	9.11	.826	71.0	S. 78° W.
	Aug.	29.92	.854	67.9	S. 85° W.
	Sept.	0.43	.996	71.5	S. 88° W.
	Oct.	0	26.079	71.0	S. 83° W.
	Nov.	0	.142	65.3	N. 31° W.
	Dec.	0	.183	63.7	N. 12° W.
1890.	Jan.	0	...	...	?
	Feb.	0	26.137	64.0	N. 43° W.
	Mar.	0.17	.044	67.5	N. 76° W.
	April	0.54	.041	77.1	N. 81° W.
	May	0	*25.953	†79.3	N. 74° W.
	June	5.51	.829	74.8	S. 57° W.
	July	28.35	.784	67.9	S. 63° W.
	Aug.	27.87	.890	65.8	S. 61° W.
	Sept.	2.17	.979	69.4	N. 79° W.
	Oct.	0	27.107	71.3	N. 37. W.
	Nov.	0	.167	66.2	S. 73° E.
	Dec.	0.02	.145	59.6	S. 67° W.
1891.	Jan.	1.14	26.158	57.6	N. 22° W.
	Feb.	0	.145	57.4	N. 13° W.
	Mar.	0.66	.092	63.0	N. 31° W.
	April	0	.075	76.0	S. 88° W.
	May	0.11	.001	79.0	N. 87° W.
	June	1.52	25.924	77.4	S. 70° W.
	July	26.00	.807	72.0	S. 71° W.
	Aug.	10.31	.890	68.2	S. 56° W.
	Sept.	2.28	.983	69.9	N. 80° W.
	Oct.	0.02	26.143	71.7	N. 51° W.
	Nov.	0	.289	66.5	N. 37° E.
	Dec.	0	.218	62.2	N. 9° W.
1892.	Jan.	0.78	26.155	60.9	S. 52° W.
	Feb.	0.03	.088	63.1	N. 73° W.
	Mar.	0	.070	73.5	N. 36° W.
	April	0	.077	80.9	N. 67° W.
	May	1.92	...	76.1	S. 76° W.
	June	4.14	?25.780	75.9	S. 59° W.
	July	19.64	?	71.1	S. 48° W.
	Aug.	38.22	?	68.3	S. 79° W.
	Sept.	34.63	?	68.5	N. 47° W.
	Oct.	0.59	...	68.9	N. 62° E.
	Nov.	0	?	63.3	N. 24° W.
	Dec.	0.18	?	59.6	N. 62° W.
1893.	Jan.	0.37	26.072	54.3	N. 14° W.
	Feb.	0.78	.080	52.5	N. 4° W.
	Mar.	0.40	.083	65.7	N. 2° W.
	April	0	.044	77.6	N. 62° W.
	May	2.03	25.964	75.7	S. 78° W.
	June	24.15	.846	74.4	S. 64° W.
	July	39.73	.822	67.1	S. 61° W.
	Aug.	8.47	.885	67.9	S. 83° W.
	Sept.	50.31	.927	66.7	S. 62° W.
	Oct.	0.76	26.098	68.1	N. 49° E.
	Nov.	3.30	.168	63.4	N. 69° E.
	Dec.	0	.190	61.4	N. 9° E.
1894.	Jan.	0.60	26.120	57.6	S. 87° W.
	Feb.	0	.123	62.7	S. 88° W.
	Mar.	0.48	.084	67.9	N. 77° W.
	April	0.02	.030	77.1	S. 72° W.
	May	0.52	25.979	77.7	S. 57° W.
	June	11.16	.823	73.1	S. 48° W.
	July	49.20	.787	67.7	S. 49° W.
	Aug.	8.67	.841	66.3	S. 51° W.
	Sept.	8.25	.959	69.6	N. 87° W.
	Oct.	0.11	26.072	70.4	N. 33° W.
	Nov.	0	.191	64.9	N. 1° E.
	Dec.	0.84	.146	58.7	S. 70° W.

* Mean of 25 days.

† Mean of 21 days.

Monthly Statements of Rainfall, &c. (continued)

Year.	Month.	Rainfall.	8 A.M. Barometer.	Mean Daily Temperature.	Mean Wind Direction.
1895.	Jan.	0.10	26.111	56.1	N. 30° E.
	Feb.	0	.105	61.9	S. 8° E.
	Mar.	0.66	.080	68.7	N. 88° W.
	April	0.13	.041	77.2	S. 86° W.
	May	0.01	25.994	80.7	S. 71° W.
	June	6.32	.857	75.1	S. 39° W.
	July	17.93	.850	70.7	S. 42° W.
	Aug.	24.56	.849	67.1	S. 46° W.
	Sept.	0.54	26.015	70.8	S. 73° W.
	Oct.	0.10	.100	71.2	N. 79° E.
	Nov.	0	.189	68.9	N. 88° W.
	Dec.	0	.170	60.1	N. 13° W.
1896.	Jan.	0	26.143	60.7	N. 83° W.
	Feb.	0	.114	61.6	S. 84° W.
	Mar.	0	.088	70.3	N. 79° W.
	April	0	.034	79.9	S. 89° W.
	May	0	.006	80.1	S. 65° W.
	June	12.69	25.829	75.5	S. 54° W.
	July	13.99	.822	70.2	S. 46° W.
	Aug.	23.19	.876	67.2	S. 51° W.
	Sept.	3.94	26.015	67.9	S. 37° W.
	Oct.	0	.149	73.2	N. 87° W.
	Nov.	2.71	.128	66.8	N. 40° W.
	Dec.	0.43	.181	60.3	N. 18° W.
1897.	Jan.	0.37	26.118	56.5	S. 80° W.
	Feb.	0	.081	59.8	N. 70° W.
	Mar.	0	.054	66.9	N. 89° W.
	April	0.08	.076	76.4	S. 82° W.
	May	0	25.977	82.1	S. 59° W.
	June	0.42	.868	79.2	S. 58° W.
	July	20.25	.802	72.4	S. 28° W.
	Aug.	20.87	.838	69.8	S. 48° W.
	Sep.	13.30	.981	70.0	S. 8° W.
	Oct.	2.54	26.099	68.3	N. 79° W.
	Nov.	0	.153	65.1	N. 6° E.
	Dec.	0	.178	60.2	N. 81° W.
1898.	Jan.	0	26.180	63.5	N. 38° W.
	Feb.	0.64	.017	59.4	S. 79° W.
	Mar.	0	.093	70.1	N. 88° W.
	April	0	.035	80.9	N. 86° W.
	May	1.01	25.967	79.4	S. 72° W.
	June	3.00	25.844	75.8	S. 46° W.
	July	19.45	7.95	70.2	S. 48° W.
	Aug.	1.63	.858	67.6	S. 47° W.
	Sept.	6.25	.965	69.7	S. 55° W.
	Oct.	0	26.106	74.0	N. 21° E.
	Nov.	0	.131	68.3	N. 21° W.
	Dec.	1.73	.133	59.2	S. 71° W.

Monthly Statement of Mean Daily Temperature and Rainfall for the Ten Years 1888–97 *at Erinpura.*

Year.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		TOTAL.	
	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.	Mean Daily Temperature.	Rainfall.
1888	66.96	...	55.79	2.00	83.22	...	90.93	...	97.82	...	96.60	0.65	88.58	1.98	84.52	11.47	85.52	...	86.58	...	77.03	...	72.51	...	986.06	16.10
1889	69.95	...	77.28	...	75.88	...	92.70	3.23	96.38	5.52	85.05	1.32	89.80	6.54	86.24	0.80	87.17	...	84.89	...	74.43	...	74.06	...	993.83	17.41
1890	75.69	...	75.52	...	80.58	...	94.65	0.21	98.91	...	92.26	0.82	85.61	8.55	85.01	3.58	88.28	0.90	86.19	...	79.81	...	62.87	0.10	1005.38	14.16
1891	67.64	...	68.03	...	...	0.48	93.20	...	99.97	...	99.18	...	92.71	9.45	87.82	0.68	89.68	0.30	87.51	...	78.40	...	72.58	...	936.72	10.91
1892	72.58	0.50	77.43	0.25	87.23	...	98.91	...	95.09	0.94	95.30	1.10	88.93	3.99	83.05	11.82	84.93	15.49	84.38	1.45	76.36	...	67.79	...	1011.98	35.54
1893	63.69	0.42	65.82	0.76	81.93	0.34	92.33	...	94.77	0.51	91.26	7.80	83.87	9.64	87.85	3.81	85.28	6.30	82.76	0.50	76.35	2.80	72.58	...	978.49	32.88
1894	68.08	0.80	74.75	...	97.01	0.18	88.88	...	96.05	...	90.83	3.88	85.14	3.69	85.63	2.38	87.33	2.35	85.77	0.20	75.92	...	66.82	0.70	1002.21	14.18
1895	69.14	...	79.67	...	85.45	0.50	95.01	...	101.98	...	94.90	4.06	88.12	2.68	85.69	5.31	92.82	0.38	87.11	...	81.01	...	71.68	...	1032.58	12.93
1896	71.68	...	71.65	...	89.87	...	100.10	...	102.85	...	95.03	9.15	88.76	8.95	82.77	7.15	85.37	0.12	87.64	...	80.38	1.58	73.14	0.45	1029.24	27.40
1897	66.82	...	72.35	...	86.35	...	93.30	...	104.27	...	95.06	2.41	83.79	9.04	81.97	5.94	85.25	3.74	84.16	0.39	81.18	...	76.74	...	1011.24	21.52
Total	692.23	1.72	718.29	3.01	767.52	1.50	940.01	3.44	988.09	6.97	935.47	31.19	875.31	64.51	850.55	52.94	871.63	29.58	856.99	2.54	780.87	4.38	710.77	1.25	9987.73	203.03

Rainfall as Recorded at Sirohi for Seven Years, from 1891 *to* 1897.

Months.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Total.	Average.	Remarks.
Jan. . .	0.52	0.50	...	0.32	...	0.06	0.11	1.51	0.22	...
Feb. . .	...	...	0.59	...	...	...	...	0.59	0.08	...
March .	0.40	...	0.50	0.12	0.40	...	...	1.42	0.20	
April .	...	...	...	...	...	..	...	...	...	...
May . .	3.35	0.50	0.40	...	...	...	...	4.25	0.61	...
June . .	0.45	0.40	13.23	3.41	3.35	4.32	0.30	25.46	3.64	...
July . .	14.44	5.52	10.38	15.77	4.52	5.57	7.83	64.03	9.15	...
Aug. . .	1.34	12.69	3.29	3.30	4.05	9.69	5.35	39.71	5.67	...
Sept. . .	0.62	16.79	11.43	1.97	0.45	...	6.28	37.54	5.36	...
Oct. . .	...	...	0.20	...	0.32	...	0.74	1.26	0.18	...
Nov. . .	...	...	2.9	...	...	1.21	...	3.30	0.47	...
Dec. . .	...	...	...	0.65	...	0.15	...	0.80	0.11	...
Total .	21.24	36.40	42.11	25.54	13.09	21.00	20.61	179.87	25.69	...

Rainfall as Recorded at Jaisalmir for Seven Years, from 1891 *to* 1897.

Months.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Total.	Average.	Remarks.
Jan. . .	0.20	0.96	0.29	1.32	0.17	...	0.15	3.09	0.44	...
Feb. . .	...	...	0.44	0.50	0.02	...	...	0.96	0.14	...
March .	0.66	...	...	0.12	0.71	0.03	...	1.52	0.22	...
April .	0.62	...	...	...	...	...	0.92	1.54	0.22	...
May . .	0.12	0.33	1.28	...	0.19	...	...	1.92	0.27	...
June . .	...	0.47	2.07	1.94	0.84	0.64	0.18	6.14	0.88	...
July . .	2.45	5.89	7.53	1.89	0.42	1.85	2.11	22.14	3.16	...
Aug. . .	0.41	3.16	2.21	5.30	0.43	1.11	5.28	17.90	2.56	...
Sept. .	0.7	0.17	1.27	0.52	0.23	...	2.49	4.75	0.68	...
Oct. . .	...	...	...	...	...	...	...	...	...	...
Nov. . .	...	...	0.10	...	...	...	...	0.10	0.01	...
Dec. . .	...	0.16	0.05	...	...	...	...	0.21	0.03	...
Total .	4.53	11.14	15.24	11.59	3.01	3.63	11.13	60.27	8.61	...

Rainfall as Recorded at Khaba for Three Years, from 1895 *to* 1897.

Months.	1895.	1896.	1897.	Total.	Average.	Remarks.
January	...	...	...	...	...	...
February	...	...	...	...	...	...
March	...	0.05	...	0.05	0.02	...
April	...	...	0.10	0.10	0.03	...
May	0.02	...	...	0.02	0.01	...
June	0.11	0.76	...	0.87	0.29	...
July	1.27	0.96	2.19	4.42	1.47	...
August	2.38	1.22	6.33	9.93	3.31	...
September	...	...	2.15	2.15	0.72	...
October	...	...	...	...	...	...
November	...	...	...	...	...	...
December	...	...	...	...	...	...
Total	3.78	2.99	10.77	17.54	5.85	

Rainfall as Recorded at Ramgarh for Three Years, from 1895 *to* 1897.

Months.	1895.	1896.	1897.	Total.	Average.	Remarks.
January	...	...	...	...	...	...
February	...	...	0.10	0.10	0.03	...
March	...	...	...	...	...	...
April	...	...	...	...	...	...
May	...	...	...	...	...	...
June	1.24	0.70	...	1.94	0.65	...
July	0.37	0.20	1.78	2.35	0.78	...
August	1.57	...	3.90	5.47	1.82	...
September	0.67	...	0.70	1.37	0.46	...
October	...	...	...	...	...	...
November	...	...	...	...	...	...
December	...	...	...	...	...	...
Total	3.85	0.90	6.48	11.23	3.74	

Rainfall as Recorded at Dewa for Three Years, from 1895 *to* 1897.

Months.	1895.	1896.	1897.	Total.	Average.	Remarks.
January	...	...	0.15	0.15	0.05	...
February	...	...	...	...	...	...
March	...	...	0.03	0.03	0.01	...
April	...	...	0.19	0.19	0.06	...
May	...	...	...	...	...	...
June	0.07	0.50	0.50	1.07	0.36	...
July	0.80	0.56	1.84	3.20	1.07	...
August	0.77	0.07	7.88	8.72	2.90	...
September	...	...	1.16	1.16	0.39	...
October	...	...	...	...	...	...
November	...	...	...	...	...	...
December	...	...	...	...	...	...
Total	1.64	1.13	11.75	14.52	4.84	

From the foregoing tables for Marwar it will be observed that there is a great difference throughout the year between the day and night temperatures. It is intensely hot during the day in the summer months, while the nights are generally fairly cool. During the winter months the weather is delightfully cool and bracing. The climate is extremely dry. The average annual rainfall in Marwar for the seven years 1891–97 was 16.09 inches, and, if 1893 be excluded, when the rainfall was abnormally heavy, the average would be 14.46. The heaviest rainfall was in 1893, viz., 25.89 inches; and the lightest in 1891, viz., 9.51. Jaswantpura is the most favoured of the Parganas, having an average rainfall of 26.54. The average in Bali, Sanchore, and Jalore is 22.47, 19.69, and 17.71 respectively, while Sankra has an average of only 7.51 inches, the lightest rainfall recorded. The rainfall of Jodhpore city varies as much as that of the Parganas; 29.72 inches were registered in 1893, and only 6.96 in 1887.

BIRDS

The birds of these States have unusual advantages in both climate and food, and they are, consequently, very numerous and varied. During the cold weather there is mostly abundance of food and water in the desert, and birds of almost every sort flock to the fresh feeding-grounds, which have been comparatively deserted by the feathered tribes throughout the hot months. Again, when water and food become scarce and the heat uncongenial to them, they repair to the adjacent hills, where they find plenty of fruit and a cool climate. Many of the small birds which nest on Mount Abu and the Aravallis would leave this part of the country during the summer if it were not for the superior climate of these hills. Mount Abu is favoured with many song-birds, and most of the summer visitants wear their best plumage while on the hill, and nest there. The blackbird (*Merula nigropilcus*) whistles regularly from early May till the end of the rains, and it is quite equal in song to *Merula musica* of the old country. The cuckoo (*Cuculus micropterus*), like *Cuculus canorus* of Europe, leaves the hatching and care of its offspring to a foster-mother, and, instead, devotes much time to call. This cuckoo calls continually in Mount Abu from the end of May till August, and although a smaller bird than the home variety, its note is not less clear and distinct. Robins, wrens, and warblers innumerable join in song at early dawn throughout these hills; and honey-suckers, bee-eaters, spider-hunters, fly-catchers, bulbuls, finches, oriols, and tits, of the most brilliant and varied hues, throng the glens and shady nooks throughout the day, and

Garden, House, and Temple.

To face page 352.

many of them visit the gardens in the mornings and evenings in pursuit of food. *Cinnyris Asiatica*, the small purple honey-sucker, is the commonest about gardens, but there are others of this species often seen. The classification laid down in Butler's Catalogue will be adhered to, as far as possible, for the ordinary birds, and his nomenclature will also be followed. The game birds, of which most are winter visitants, have been given in accordance with Hume and Marshall's nomenclature. In years of very light rainfall game birds are scarce, and other birds less plentiful also; but when the tanks fill, waterfowl are abundant, and, when the grass is good, Imperial sand-grouse, crane, bustard, hobara, and the feathered tribes in general abound throughout the desert, as well as in the fertile parts of these States.

RAPTORES (Birds of Prey).

Fam. VULTURIDÆ (Vultures).—*Sub-Fam.* VULTURINÆ (True Vultures).

Otogyps calvus: The Black Vulture.
Permanent resident. Met with in these States in considerable numbers at times; at other times they are rarely seen, as if they migrated when food supplies fail.

Gyps pallescens: The Long-billed Brown Vulture.
Permanent resident. Met with at Abu and along the Aravallis.

Pseudogyps bengalensis: The White-backed Vulture.
Permanent resident, though not very common.

Sub-Fam. NEOPHRONINÆ (Scavengers).

Neophron ginginianus: The White or Indian Scavenger Vulture.
Permanent resident, seen at every village.

Fam. FALCONIDÆ (Falcons).—*Sub-Fam.* FALCONINÆ (True Falcons).

Falco peregrinus: The Peregrine Falcon.
Cold weather visitant.

Falco peregrinator: The Shaheen Falcon.
Permanent resident, seen throughout the States.

Falco jugger: The Laggar Falcon.
Permanent resident, common everywhere.

Buteo desertorum: The African Buzzard.
Winter visitant.

Falco subbuteo: The European Hobby.
Winter visitant, only occasionally seen. Sometimes used for sport—hawking.

Astur palumbarius: The Goshawk.
Winter visitant, and sometimes trained for sport.

Cerchneis tinnunculus: The Kestrel.
Cold weather visitant. Sometimes trained for shikar.

Cerchneis Naumanni: The Lesser Kestrel.
Cold weather visitant.

Cerchneis amurensis: The Eastern Orange-legged Hobby or Kestrel.
Cold weather visitant.

Sub-Fam. ACCIPITRINÆ (Hawks).

Astur badius: The Shikra or Indian Sparrow-Hawk.
Permanent resident in most parts of the region. It is met with throughout the country at all seasons, and is often trained for sport.

Astur soloënsis: The Sooloo Falcon.
Winter visitant. Seen in Godwar in the cold weather.

Accipiter nisus: The European Sparrow-Hawk.
Cold weather visitant. Captured and trained for sport.

Accipiter virgatus: The Besra Sparrow-Hawk.
Permanent in the Aravallis; it is trained for sport.

Sub-Fam. AQUILINÆ (Eagles).

Aquila Vindhiana: The Indian Tawny Eagle.
Permanent resident. Generally seen about the higher hills.

Nisaëtus fasciatus: Bonnelli's Eagle.
Permanent resident.

Limnaëtus cirrhatus: The Crested Hawk-Eagle.
Permanent resident.

Circaëtus gallicus: The Common Serpent-Eagle.
Probably a permanent resident in the hills.

Spilornis melanotis: The Lesser or Southern Indian Harrier-Eagle.
Permanent resident.

Butastur teesa: The White-eyed Buzzard.
Permanent resident.

Buteo Plumipes: The Harrier-Buzzard. Met with about the hills.

Sub-Fam. Milvinæ (Kites).

Haliastur indus : The Maroon-backed or Brahminy Kite.
Permanent resident. Seen throughout these States.
Milvus govinda : The Common Pariah Kite.
Permanent resident Seen at every village.
Milvus melanotis : The Large Pariah Kite.
Permanent resident. Lives about the hills in the hot months.
Pernis ptilorhynchus : The Crested Honey-Buzzard.
Permanent resident.
Elanus cæruleus : The Black-winged Kite.
Permanent resident, though rare in these States.

Fam. Strigidæ (Owls).—*Sub-Fam.* Striginæ (Owls).

Strix javanica : The Indian Screech Owl.
Permanent resident. Found about old buildings and hollow trees ; sits on the house-top and makes a noise at night.
Strix candida : The Grass Owl.
Permanent resident near the hills.

Sub-Fam. Syrniinæ (Hooting Owls).

Syrnium indranee : The Brown Wood Owl.
Met with in the Aravalli range and Abu hills.
Bubo coromandus : The Dusky Horned Owl.
Permanent resident.
Syrnium ocellatum : The Mottled Wood Owl.
Permanent resident. This bird is of ill omen when it sits on or about the houses at night, repeating its doleful note. It lives in clumps of trees adjacent to towns, and visits gardens and compounds frequently in search of mice and rats.

Sub-Fam. Buboninæ (Eagle and Scops Owls).

Bubo bengalensis : The Rock-horned Owl.
Permanent resident.
Ketupa ceylonensis : The Brown Fish Owl.
Permanent resident, although rare in these States.
Scops malabaricus : The Malabar Scops Owl.
Permanent resident.

Sub-Fam. Surniinæ (Diurnal or Twilight Owls).

Carine brama: The Spotted Owlet.
Permanent resident. Common about old buildings in the desert.

Ninox scutulata: The Brown Hawk-Owl.
Permanent resident in the Aravallis.

Glaucidium malabaricum: The Malabar Owlet.
Permanent resident. Met with in the high wooded lands.

INSESSORES (Perching Birds).

Tribe—FISSIROSTRES (Wide Gape; usually feed on the wing).

Fam. Hirundindiæ (Swallows, Martins, and Swifts).—*Sub-Fam.* Hirundininæ (Swallows and Martins).

Hirundo rustica: The Common Swallow.
Cold weather visitant, but very common then.

Hirundo filifera: The Wire-tailed Swallow.
Permanent resident, thought not very common.

Hirundo erythropygia: The Red-rumped or Mosque Swallow.
Permanent resident.

Hirundo fluvicola: The Indian Cliff Swallow.
Permanent resident. Not common in these States.

Cotyle sinensis: The Indian Sand Martin.
Permanent resident, and very common in some parts near rivers and streams.

Ptyonoprogne concolor: The Dusky Crag Martin.
Permanent resident and common.

Ptyonoprogne rupestris: The Mountain Crag Martin.
Cold weather visitant.

Chelidon urbica: The English House Martin.
Seasonal visitant. Sometimes seen in great numbers.

Sub-Fam. Cypsellinæ (Swifts).

Cypsellus affinis: The Common Indian Swift.
Permanent resident, and seen in great numbers in many places.

Cypsellus batassiensis: The Palm Swift.
Permanent resident. Met with in a few places only in Sirohi.

Dendrochelidon coronata: The Indian Crested Swift.
Permanent resident.

Fam. Caprimulgidæ (Nightjars or Goat-suckers).—*Sub-Fam.* Caprimulginæ (Nightjars).

Caprimulgus indicus: The Jungle Nightjar.
Permanent resident throughout the hills and wooded parts of these States.

Caprimulgus Kelaarti: The Nilgiri Nightjar.
Seen throughout the wooded parts of these States.

Caprimulgus atripennis: The Ghat Nightjar.

Caprimulgus asiaticus: The Common Indian Nightjar.
Permanent resident, and common where there are trees and bushes.

Fam. Trogonidæ (Trogons).

Harpactes fasciatus: The Malabar Trogon.
Permanent resident. Found only in the wooded regions.

Fam. Meropidæ (Bee-eaters).

Merops viridis: The Common Indian Bee-eater.
Permanent resident. Seen on Mount Abu and about the lower hills.

Merops swinhoii: The Chestnut-headed Bee-eater.
Seen in the hills.

Fam. Coraciadæ (Rollers).

Coracias indica: The Indian Roller.
Met with in many places during the cold weather; takes to the the hills and wooded regions in the hot season. A handsome bird, sometimes mistaken for the blue jay.

Fam. Alcedinidæ (Kingfishers).

Alcedo bengalensis: The Common Indian Kingfisher.
Permanent resident. Met with at all tanks and streams, but common only in the cold weather and rains.

Alcedo beavani: Beavan's Kingfisher.
Rare.

Ceryle rudis: The Pied Kingfisher.
Permanent resident, and common in some parts at certain seasons, only when water is abundant.

Fam. Bucerotidæ (Hornbills).

Dichoceros cavatus: The Great Hornbill.
Met with in the wooded parts only.
Tockus griseus: The Jungle Grey Hornbill.
Permanent resident. Seen in the Aravallis and Abu hills.

Tribe—SCANSORES (Climbers).

Fam. Psittacidæ (Parrots).—*Sub-Fam. Palæorninæ* (Parrakeets).

Palæornis torquatus: The Rose-ringed Parroquet.
Permanent resident in the hill country.
Loriculus vernalis: The Indian Loriquet or Green Parrot.
Resident in the hills in the hot weather all over the country; in the cold, in flocks.
Palæornis purpureus: The Rose-headed Parroquet.
Met with in the hills and wooded lands adjacent.
Palæornis columboides: The Blue-winged Parroquet.
Met with in the hills mostly.
Palæornis schisticeps: The Slaty-headed Parroquet.
Met with in the hills here during the hot weather.

Fam. Picidæ (Woodpeckers).—*Sub-Fam. Picinæ* (Typical Woodpeckers).

Picus mahrattensis: The Yellow-fronted Woodpecker.
Permanent resident in the wooded parts of these States.

Sub-Fam. Campephilinæ (Woodpeckers).

Chrysocolaptes strictus: The Southern Large Golden-backed Woodpecker.
Permanent resident in the well-wooded regions and hills.

Sub-Fam.—Gecininæ.

Gecinus striolatus: The Small Green Woodpecker; and *Chrysophlegma chlorigaster:* The Yellow Woodpecker, are also met with.
Brachypternus puncticollis: The Lesser Golden-backed Woodpecker.
Permanent resident.
Micropternus phæoceps: The Rufous Woodpecker.
Permanent in the hills.

Fam. MEGALÆMIDÆ (Barbets).

Megalæma inornata: The Western Green Barbet.

Common throughout the hills and wooded regions, and found in the Khejra belts of the desert in the cold weather.

Megalæma viridis: The Small Green Barbet.

Permanent resident. Mostly seen in the high lands in the summer; common in Godwar.

Xantholæma hæmacephala: The Crimson-breasted Barbet or Coppersmith.

Permanent resident.

Fam. CUCULIDÆ (Cuckoos).—*Sub-Fam.* CUCULINÆ (True Cuckoos).

Cuculus micropterus: The Indian Cuckoo.

This Cuckoo is common on Mount Abu and some of the adjacent hills. It begins to call about the end of May and continues throughout the rains; it lays its eggs in the nest of another bird, like *Cuculus canorus*, the English Cuckoo, which it resembles, although smaller. Its note is clear and distinct.

Cacomantis passerinus: The Indian Plaintive Cuckoo.

Found in the forests at certain seasons.

Eudynamis honorata: The Indian Koel.

Permanent resident in some districts, met with most frequently adjacent to the low hills.

Sub-Fam. CENTROPODINÆ (Coucals and Sirkeers).

Centrococcyx rufipennis: The Common Coucal or Crow-Pheasant.

Permanent resident. Met with about gardens and wooded lands adjacent to villages.

Tribe—TENUIROSTRES (Soft-billed Birds).

Fam. NECTARINIDÆ (Honey-Suckers and Spider-Hunters.
Sub-Fam. NECTARININÆ.

Arachnothera longirostra: The Little Spider-Hunter.

Rare. Found in the wooded hills only.

Œthopyga vigorsi: The Violet-eared Red Honey-Sucker.

Permanent resident. Seen in the hills and wooded places with the other varieties; sometimes abundant about gardens in Abu.

Cinnyris zeylonica: Amethyst-rumped Honey-Sucker.
Permanent resident.
Cinnyris minima: The Tiny Honey-Sucker.
Permanent resident.
Cinnyris asiatica: The Purple Honey-Sucker.
Permanent resident. Common on Mount Abu about gardens; may be seen going about flowers and thrusting its beak into them.

Sub-Fam. DICÆINÆ (Flower-Peckers).

Dicæum erythrorhynchum: The Small Flower-Pecker.
Permanent resident. Mostly on or near the hills in the hot months. There are three or four varieties, and some of them are handsomely marked.

Fam. UPUPIDÆ (Hoopoes).—*Sub-Fam.* UPUPINÆ (Hoopoes).

Upupa ceylonensis: The Indian Hoopoe.
Common in the south of India, and seen here.
Upupa epops: The European Hoopoe.
Permanent resident. This well-known and pretty bird is found all over the country from September till April, when it disappears almost completely from these States, and is hardly seen in the hills till the cold weather begins. A few may remain in the hills, as I have seen them late in the year.

Tribe—DENTIROSTRES (with a tooth near the tip of the bill).

Fam. LANIADÆ (Shrikes or Butcher-Birds).—*Sub-Fam.* LANIANÆ (True Shrikes).

Lanius lahtora: The Indian Grey Shrike.
Lanius erythronotus: The Indian Rufous-backed Shrike.
Permanent resident in most localities. Common everywhere.
Lanius vittatus: The Bay-backed Shrike.
Permanent resident in many localities. Common.
Lanius isabellinus: The Desert Shrike.
Common in many parts of these States.

Sub-Fam. MALACONOTINÆ (Wood Shrikes).

Tephrodornis sylvicola: The Malabar Wood Shrike.
Not common.

Tephrodornis pondicerianus: The Common Wood Shrike.
Permanent resident.
Hemipus picatus: The Little Pied Shrike.
Not common.

Sub-Fam. Campephaginæ (Cuckoo Shrikes and Minivets).

Volvocivora sykesi: The Black-headed Cuckoo Shrike.
Not common.
Pericrocotus flammeus: The Orange Minivet.
Permanent resident. Mostly seen about the low hills.
Pericrocotus peregrinus: The Small Minivet.
Permanent resident. Met with in numbers in Sirohi State.
Pericrocrotus erythropygius: The White-bellied Minivet.
Rare.
Pericrocotus solaris: The Yellow-throated Minivet.
Sometimes seen.

Sub-Fam. Dicrurinæ (Drongo Shrikes or King-crows).

Buchanga atra: The Common Drongo Shrike or King-crow.
Common in most parts of the country.
Buchanga longicaudata: The Long-tailed Drongo.
Permanent resident in the hills and wooded high lands.
Buchanga cærulescens: The White-bellied Drongo.
Permanent resident in the Aravalli range.
Chaptia ænea: The Bronzed Drongo.
Permanent resident in the high wooded lands.
Dissemurus paradiseus: The Malabar Racket-tailed Drongo.
Permanent resident. Found in the bamboo jungles and low hills.
Chibia hottentotta: The Hair-crested Drongo.
Seen in the hills.

Fam. Muscicapidæ (Fly-catchers).—*Sub-Fam.* Myiagrinæ (Fly-catchers and Fantails).

Muscipeta paradisi: The Paradise Fly-catcher.
Met with in the hills and high wooded lands.
Hypothymis azurea: The Black-naped Blue Fly-catcher.
Met with in the high and wooded lands, and in the desert in cold weather.

Leucocerca aureola: The White-browed Fantail Fly-catcher.
Rare.

Leucocerca leucogaster: The White-spotted Fantail Fly-catcher.
Permanent resident.

Sub-Fam. Muscicapinæ (Fly-catchers, Redbreasts, Bluechats, &c.).

Alseonax latirostris: The Southern Brown Fly-catcher.
Cold weather visitant.

Stoporala melanops: The Verditer Fly-catcher.
Cold weather visitant.

Cyornis tickelli: Tickell's Blue Redbreast.
Permanent resident in the forest districts and high lands.

Cyornis ruficaudus: The Rufous-tailed Fly-catcher.
Cold weather visitant. Rare.

Cyornis pallipes: The White-bellied Blue Fly-catcher.
Probably only a cold weather visitant. Rare.

Erythrosterna parva: The White-tailed Robin Fly-catcher.
Cold weather visitant.

Fam. Merulidæ (Thrushes). — *Sub-Fam.* Myiotherinæ (Ground Thrushes, Wrens, Hill Wrens, Shortwings, Whistling Thrushes, Water Ouzels, &c.).

Myiophoneus horsfieldi: The Malabar Whistling Thrush.
Permanent resident in the hills.

Pitta brachyura: The Indian Ground Thrush.
Permanent resident in the hills, seasonal in the low lands and desert.

Petrophila cinclorhyncha: The Blue-headed Chat-Thrush.
Cold weather visitant.

Geocichla cyanotis: The White-winged Ground Thrush.
Permanent resident.

Geocichla citrina: The Orange-headed Ground Thrush.
Cold weather visitant.

Merula nigropileus: The Black-capped Blackbird. The Abu Blackbird.
Permanent resident in the hills. It begins to whistle in May and continues throughout the rains; its note is very like that of the English Blackbird, *Merula musica*, and its appearance is also much the same. Although smaller, it has the yellow beak, flight, and appearance of the English song-bird.

Sub-Fam. Timalinæ (Babbling-Thrushes, Finch-Thrushes, Tit-Thrushes, Jay-Thrushes, Strike-Thrushes, Wren-Babblers, Scimitar-Babblers, Laughing-Thrushes, Bar-Wings, Sibias, Bush-Babblers, Reed-Babblers, Marsh-Babblers, Grass-Babblers, and Reed-Birds).

Pyctoris sinensis: The Yellow-eyed Babbler.
Permanent resident. Met with throughout these States.
Alcippe atriceps: The Black-headed Wren-Babbler.
Common in many parts of these States.
Dumetia hypherythra: The Rufous-bellied Babbler.
Permanent resident.
Dumetia albogularis: The White-throated Wren-Babbler.
Permanent resident.
Pomatorhinus horsfieldi: The Southern Scimitar-Babbler.
Permanent resident.
Argya malcolmi: The Large Grey Babbler.
Permanent resident.
Layardia subrufa: The Rufous Babbler.
Permanent in the hills.

Fam. Brachypodidæ (Short-legged Thrushes).—*Sub-Fam.* Pycnonotinæ (True Bulbuls).

Hypsipetes ganeesa: The Ghat Black Bulbul.
Permanent resident. Found near the hills in the hot weather; at other seasons more widely distributed.
Criniger ictericus: The Yellow-browed Bulbul.
Permanent resident.
Turdinus Abbotti: Abbott's Thrush-Babbler.
Uncommon.
Ixus luteolus: The White-browed Bush Bulbul.
Permanent resident.
Rubigula gularis: The Ruby-throated Bulbul.
Common on Mount Abu and the higher hills in summer, met with in many places below during the cold season.
Brachypodius poiocephalus: The Grey-headed Bulbul.
Permanent resident.
Otocompsa fuscicaudata: The Southern Red-whiskered Bulbul.
Permanent resident.

Sub-Fam. Phyllornithinæ (Green Bulbuls).

Phyllornis jerdoni : The Common Green Bulbul.
Permanent resident.
Iora tiphia : The Black-headed Green Bulbul.
Permanent resident.

Sub-Fam. Oriolinæ (Orioles).

Oriolus kundoo : The Indian Oriole.
Permanent resident in many of the well-wooded plateaus, but not common ; occasionally seen away from the heavy forests.
Oriolus indicus : The Black-naped Indian Oriole.
Occasionally seen.
Oriolus melanocephalus : The Bengal Black-headed Oriole.
Rare.

Fam. Sylviadæ (Warblers).—*Sub-Fam.* Saxicolinæ (Stonechats, Wheatears, Indian Robins, Bushchats, Rockchats, &c.).

Copsychus saularis : The Magpie Robin.
Permanent resident throughout the country.
Cercotrichas macrura : The Shama.
Permanent resident. Seen in both hills and plains.
Thamnobia fulicata : The Indian Black Robin.
Permanent resident. Met with about houses and old ruins, where it builds. Omens are taken from this bird. If it build its nest high up, millet will be long ; if it use much grass for its nest, there will be a grass famine.
Pratincola caprata : The White-winged Bushchat.
Permanent resident.
Pratincola indicus : The Indian Bushchat.
Cold weather visitant.

Sub-Fam. Ruticillinæ (Redstarts, Bluethroats, &c.).

Ruticilla rufiventris : The Indian Redstart.
Cold weather visitant.
Larvivora superciliaris : The Blue Woodchat.
Cold weather visitant. Probably permanent in the hills.

Sub-Fam. Drymoicinæ (Wren-Warblers, Indian Tailor-Birds, Grass-Warblers, and Hill-Warblers).

Orthotomus sutorius: The Indian Tailor-Bird.
Permanent resident in most of the fertile districts. It suspends its carefully sewn nest to a branch and lines it with some soft substance such as wool or cotton.

Prinia socialis: The Ashy Wren-Warbler.
Permanent resident. Seen everywhere, but commoner in the hills than below during the hot months.

Prinia gracilis: Franklin's Wren-Warbler.
Permanent resident.

Cisticola cursitans: The Rufous Grass-Warbler.
Permanent resident.

Drymœca inornata: The Earth-brown Wren-Warbler.
Permanent resident. Seen among the low bushes throughout the country.

Drymœca rufescens: The Great Rufous Wren-Warbler.
Probably a permanent resident in the well-wooded high lands.

Sub-Fam. Phylloscopinæ (Tree-Warblers, &c.)

Hypolais rama: Sykes's Warbler.
Cold weather visitant.

Phylloscopus magnirostris: The Large-billed Tree-Warbler.
Cold weather visitant.

Phylloscopus nitidus: The Bright Green Tree-Warbler.
Cold weather visitant.

Phylloscopus affinis: Tickell's Tree-Warbler.
Cold weather visitant.

Phylloscopus indicus: The Olivaceous Tree-Warbler.
Cold weather visitant.

Reguloides superciliosus: The Crowned Tree-Warbler.
Cold weather resident.

Sub-Fam. Sylviinæ (Grey Warblers, comprising Black-caps and White Throats).

Sylvia jerdoni: The Black-capped Warbler.
Cold weather visitant.

Sub-Fam. Motacillinæ (Wagtails, Pipits, Titlarks, &c.).

Motacilla maderaspatensis: The Large Pied Wagtail.
Common throughout the cold weather.
Motacilla personata : The Black-faced Wagtail.
Cold weather visitant. Common.
Motacilla dukhunensis: The Indian White-faced Wagtail.
Cold weather visitant, and seen in the rains.
Budytes cinereocapilla: The Slaty-headed Yellow Wagtail.
Cold weather visitant, returns early.
Budytes melanocephala: The Black-cap Field Wagtail.
Cold weather visitant.
Budytes flava: The Grey-backed Yellow Wagtail.
Cold weather visitant.
Zimonidromus indicus: The Black-breasted Wagtail.
Rare.
Corydalla rufula: The Indian Titlark.
Permanent resident. Seen all over the desert.

Fam. Ampelidæ.—*Sub-Fam.* Leotrichinæ (Thrush-Tits, Hill Tits, Shrike-Tits, and Flower-Peckers).

Zosterops palpebrosa: The White-eyed Tit.
Permanent resident.

Sub-Fam. Parinæ (Tits or Titmice).

Parus nipalensis: The Indian Grey Tit.
Permanent resident. Seen near the hills in the hot weather; throughout the desert in the cold.
Machlolophus aplonotus: The Southern Yellow Tit.
Permanent resident.

Tribe—CONIROSTRES (Thick-billed Birds).

Fam. Corvidæ (Crows, Magpies, &c.).—*Sub-Fam.* Corvinæ (Ravens, Crows, Rooks, Jackdaws).

Corvus macrorhynchus: The Indian Bow-billed Corby or Carrion Crow.
Permanent resident. Met with throughout the States, except in the wooded high lands.
Corvus splendens: The Common Indian Grey-necked Crow.
Permanent resident. Seen about all villages in numbers.

Corvus lawrencei: The Indian Raven.

Met with about towns and houses, often in numbers, and known by its large size and hoarse note.

Sub-Fam. DENDROCITTINÆ (Tree-Crows or Magpies).

Dendrocitta rufa: The Common Indian Magpie.

Permanent resident in the woods here. The Shikari is always pleased to see this bird, as it omens well for sport.

Dendrocitta Bayleyi: Bayley's Blue Tree-Magpie.

Common in the hills here.

Cissa chinensis: The Green or Blue Jay, well known everywhere on account of its handsome plumage.

Common throughout these States in the cold weather; permanent in the hills in the hot weather. This is a bird of good omen, and the people dislike its being shot.

Fam. STURNIDÆ (Starlings, Mynas, &c.).—*Sub-Fam.* STURNINÆ (Starlings and Mynas).

Acridotheres tristis: The Common Myna.

Permanent resident and very abundant.

Acridotheres fuscus: The Dusky Myna.

Permanent resident. Seen everywhere.

Pastor roseus: The Rose-coloured Pastor or Jowari Bird.

Cold weather visitant, when it may be seen in great numbers about the villages where grain is being winnowed.

Fam. FRINGILLIDÆ (Finches)—*Sub-Fam.* POLCEINÆ (Weaver-Birds).

Ploceus Javanensis: The Common Yellow Weaver-Bird.

Permanent resident. It is common throughout the country, and its nest may be seen suspended from the Khejra tree in many places in the desert.

Amadina punctulata: The Spotted Munia.

Permanent resident in some districts.

Amadina striata: The White-backed Munia.

Permanent resident.

Estrelda amandava: The Red Waxbill or Common Amidavad is met with throughout the cold weather in the desert, and believed to be a permanent resident in the hills.

Estrelda formosa: The Green Waxbill, another species of Amidavad, is also common at times, and may be seen in great numbers together

with the above variety. These birds roost in the Nim trees at Jodhpore, and at times, when food is abundant, they come in great numbers with Munias of various kinds, some of which are also very pretty little birds.

Sub-Fam. Passerinæ (Sparrows).

Passer domesticus: The Indian House-Sparrow.
Permanent resident. Met with in too great abundance throughout the desert and everywhere.

Sub-Fam. Fringillinæ (Bullfinches, Rose-Finches, True Finches, &c.).

Carpodacus erythrinus: The Common Rose-Finch.
Cold weather visitant. Met with on Mount Abu in the hot weather when the mulberries are ripe.

Sub-Fam. Alaudinæ (Larks, Bush-Larks, Finch-Larks, &c.).

Mirafra erythroptera: The Red-winged Bush Lark.
Permanent resident.

Ammomanes phœnicura: The Rufous-tailed Finch-Lark.
Permanent resident.

Pyrrhulauda grisea : The Black-bellied Finch-Lark.
Permanent resident.

Spizalauda deva : The Small Crown-crested Lark.
Permanent resident throughout the desert.

Spizalauda malabarica: The Northern Crown-crested Lark.
Permanent resident throughout the unwooded parts of these States.

Alauda gulgula: The Indian Skylark.
Permanent resident. Seen in all grass lands.

GEMITORES (Pigeons).

Fam. Treronidæ (Fruit Pigeons).—*Sub-Fam.* Treroninæ (Green Pigeons).

Crocopus chlorigaster: The Southern Green Pigeon.
Permanent resident. These birds frequent fig trees of all sorts, and may often be found in large numbers on banyan trees. They are excellent eating, especially if their tough skins be removed before they are cooked.

Osmotreron malabarica: The Grey-fronted Green Pigeon.
Is also met with, and sometimes in considerable numbers, when fruit is plentiful.

Sub-Fam. COLUMBINÆ (Rock Pigeons, Stock Pigeons, &c.).

Columba intermedia: The Common Indian Blue-Rock Pigeon.
Permanent resident, and common at every village throughout the desert where there is water and shade.

Sub-Fam. TURTURINÆ (Turtle-Doves and Ringdoves).

Turtur pulchratus: The Indian Turtle-Dove.
Common everywhere.
Turtur meena: The Rufous Turtle-Dove.
Not common.
Turtur suratensis: The Spotted Dove.
Permanent resident in Abu and the hills, but not common in the desert.
Turtur risorius: The Common Ringdove.
Permanent resident. Very common in the hills and plains.
Turtur senegalensis: The Little Brown Dove.
Common everywhere on the high lands, and seen in great numbers in the desert also.

The principal game birds have been given in a separate chapter, so they will not be referred to here.

GRALLATORES (Waders and Shore Birds).

Tribe—LATITORES (Coots, Rails, &c.).

Fam. RALLIDÆ (Water-Hens, Coots, Rails, &c.).—*Sub-Fam.* GALLINULINÆ (Coots, Water-Cocks and Water-Hens).

Gallinula chloropus: The Common Water-Hen
Probably a permanent resident in some parts of the region.

Fam. CURSORIDÆ (Courier Plovers).

Cursorius coromandelicus: The Indian Courier Plover.
Common everywhere except in the wooded high lands in the cold months.

Cursorius gallicus: The Cream Courier Plover.
Common except in the hottest months.
Charadrius fulvus: The Indian Golden Plover. *Ægialitis asiatica* and *Ægialitis dubia*, the Ring Plover, and *Ædiconemus scolopax*, the Stone Plover, are met with as winter visitants.

Sub-Fam. VANELLINÆ (Lapwings).

Chettusia gregaria: The Black-sided Lapwing,
Winter visitant.
Lobivanellus indicus: The Red-Wattled Lapwing, or "Did-you-do-it."
Very common everywhere.

Sub-Fam. TOTANINÆ (Sandpipers, Greenshanks, Redshanks, and Stilts), are met with throughout the cold weather, and *Porphyrio poliocephalus*, the Purple Coot, is common.

Erythra phœnicura: The White-breasted Water-Hen.

Tribe—CULTIROSTRES (Storks, Herons and Ibises).

Fam. CICONIDÆ (Storks).

Leptoptilus argalus: The Adjutant or Gigantic Stork.
Seasonal visitant.
Ciconia nigra: The Black Stork.
Cold weather visitant.
Dissura episcopa: The White-necked Stork.
Although a permanent resident in India, it is only met with here in the cold weather.

Fam. ARDEIDÆ (Herons, Egrets, Bitterns, and Night-Herons).

Ardea cinerea: The Common Blue Heron.
Common in the cold months.
Herodias torra: The Large Egret or Large White Heron.
Cold weather visitant.
Herodias intermedia: The Little White Heron.
Only met with after the rains and in the cold weather.
Ardeola grayi: The Pond Heron.
Met with after the rains and throughout the cold weather.
Botaurus stellaris: The Bittern.
Cold weather visitant. Common in all overgrown marshes.

Fam. TANTALIDÆ (Ibises, Shell and Pelican Ibises, Spoonbills, &c.).
Sub-Fam. TANTALINÆ (Pelican Ibises).

Tantalus leucocephalus: The Pelican Ibis.
Cold weather visitant.

Sub-Fam. IBISINÆ (Ibises).

Ibis melanocephala: The White Ibis.
Cold weather visitant.
Inocotis papillosus: The Warty-headed or Black Ibis.
Cold weather visitant.
Falcinellus igneus: The Glossy Ibis.
Cold weather visitant.

NATATORES (Feet more or less webbed; legs far back).

Tribe—LAMELLIROSTRES (Flamingoes, Swans, Geese, and Ducks).

Fam. PHŒNICOPTERIDÆ (Flamingoes).

Phœnicopterus antiquorum: The Flamingo.
Cold weather visitant. Seen in great numbers on the Sambhar Lake.

Tribe—MERGITORES (Divers, Grebes, &c.).

Fam. PODICIPIDÆ (Grebes).

Podiceps minor: The Little Grebe or Dabchick.
Permanent resident where the water lasts; it is found in the Abu Lake (throughout the year), where it nests.

Tribe—VAGATORES (Comprising Petrels, Gulls, and Terns).

Fam. LARIDÆ (Gulls and Terns).—*Sub-Fam.* LARINÆ (Gulls).

Larus affinis: The Slaty Herring Gull.
Cold weather visitant. Seen about the Sambhar Lake at times.
Sterna seena: The Large River Tern.
A seasonal visitant. Seen at Sambhar occasionally.
Sterna melanogastra: The Black-bellied Tern.
Seen occasionally.

Tribe—PISCATORES (Web-footed aquatic birds that perch on trees or rocks, and feed chiefly on fish).

Fam. PELICANIDÆ (Pelicans).—*Sub-Fam.* PLOTINÆ (Snake-Birds).

Plotus melanogaster: The Indian Snake-Bird.

Common everywhere in the winter. Met with on Mount Abu in the lake in the summer.

Old Palace, Jodhpore City.

To face page 373.

INSECTS

Winged and crawling things are troublesome here, especially in the monsoon season, when they disturb rest, retard work, and worry in endless ways. Only a few of this numerous division of the animal kingdom can be referred to here, and most of these are pests of man and domestic animals.

Coleoptera or Beetles.—Of this order *Byrrhidæ* or pill-beetles are the best known. There are many varieties of brown beetles met with, and the large black beetle is nearly allied to them. They are mostly harmless, except that they are troublesome in flying to the light at night. Their larvæ are destructive, and eat up many things in domestic use. *Rhynchophora* (weevils) are the most destructive of all beetles, and there are many varieties of this species. They destroy grain, biscuits, fruit, vegetables, and timber by boring into and eating up these things. *Coccinellidæ* (lady-birds and lady-cows) are of the *Coleoptera* order; they are harmless, and some of them prettily coloured, but the larvæ are very destructive and eat up woollen and silk materials, also skins and hair cushions. Packing in dried Nīm leaves is the best remedy for these destroyers, and the articles should be well exposed to sunlight and air before they are shut up.

Some of the *Coleoptera* have very brilliant elytra, which are used for decorating dresses, scarf pins, and other ornamentation. *Lytta Vesicatoria* (the blister-beetle or Spanish-fly) is a handsome insect of this class, with green elytra. It is of great value in medicine, both as an internal remedy and an external application. It is very common in the grass here during the

rains, and it may be seen at other seasons. Florican feed on this beetle during the monsoon season, and they are then undesirable for the table, as the eating of their flesh at this time is followed by great irritation of the urinary tract and painful symptoms. *Elater noctilucus* (the firefly) and *Lampyris noctiluca* (the glow-worm) are both met with here in the damper regions. They are much more luminous during the monsoon season than at other times of the year.

LOCUSTS

Order ORTHOPTERA.—*Sub-Order* SALTATORIA (Grasshoppers and Crickets).

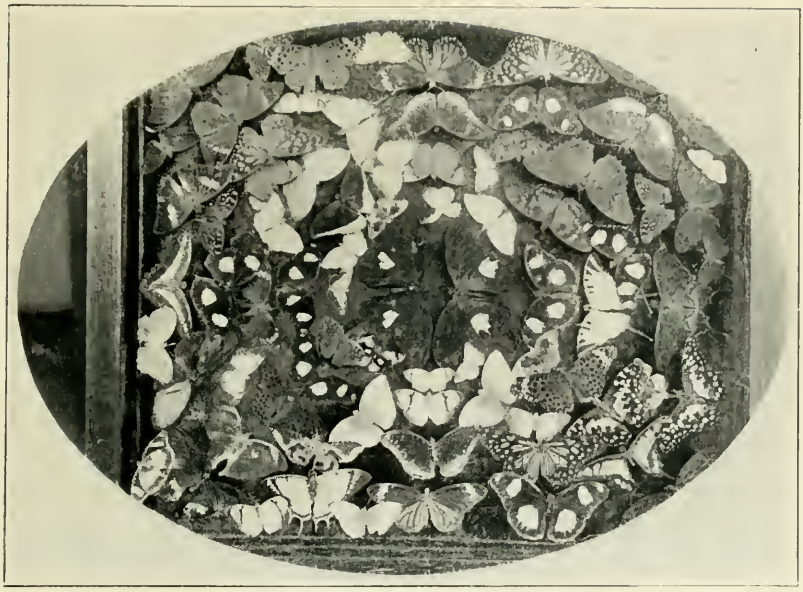
Acridum peregrinum.

LOCUSTS visit these States every four or five years and overrun the country, committing much havoc on crops and trees, and sometimes even denuding the sands of grass. They are not, however, indigenous in the *tibas* or sandhills of Marwar and Jaisalmir, as supposed by Moore and Cotes. They generally die out in the second or third year after their arrival, and I have satisfied myself that the country is absolutely free from them at times, and that reinvasion of the country is due to new flights from outside. I am of opinion that locusts come from beyond the frontier, probably from the Baluchistan and Afghanistan hills, or from Africa; and I have, on one occasion, seen them on board a P. & O. steamer in the Red Sea. They may also sometimes leave the desert after they have exhausted the food, and return again to deposit their eggs. I have seen them on one occasion come up by Abu from Ahmedabad in the cold weather; they deposited their eggs in many parts of Rajputana in the end of the following hot weather, and the young brood overran this part of the country in the rains.

Locusts generally come into these States near the end of the hot weather, deposit their eggs as soon as rain falls, and then disappear. It is supposed they die after this, like butterflies, but I have never seen them dead in large numbers, and

I have known them to fly away in good condition, having left their eggs behind. They may, however, eat up the weakly ones as they begin to drop out of the flight, as the young larvæ invariably turn on their disabled companions and devour them greedily.

The female locusts deposit their eggs in holes in the sand about an inch deep, made with their ovipositors. The eggs are stuck together by means of a mucous secretion in masses of fifty to a hundred; the mouth of the hole is sealed with the same substance, and then covered over with sand, so as to protect the eggs from rain, and prevent their being eaten up by insects and birds. The young larvæ are hatched in about a fortnight or three weeks in warm weather; but the eggs would sometimes appear to lie dormant when deposited at an untimely season, as young broods have sometimes been seen long after the winged insects had disappeared. The larvæ are very small at first and black in colour. They moult frequently, taking on several new and enlarged coverings before they attain full size. It requires over a month for them to develop wings and take to flight. As soon as they emerge from the ground they eat enormously, and, when they have grown a little and developed their muscles, they begin to hop and move forward, devouring every leaf that is green on the sands, and leaving the country behind them barer than it is in the hot weather. It is rather startling to see these creatures in some of the gardens between the bare hills at Jodhpore. They crowd into the gardens over walls, ditches, and houses, like thousands of swarms of bees, and denude every bush and plant in a few hours. I have seen them in such numbers, when there was little green vegetation in the country, that one could not walk about without killing many of them, and as soon as they were disabled or dead, their companions rushed into my footprints and devoured them greedily. Indeed, they were so ravenous and numerous, that I often thought they



Butterflies, Abu.

Locust (*Acridium succinctum*). *To face page* 376.

could have eaten me up very quickly, if they had only known how to begin. They continue in this onward march of destruction, always taking a route through the greenest parts of the country, till they have developed their wings, when they take to flight, forming enormous clouds, sometimes obscuring the sun like an eclipse or huge dust-storm. They then attack trees and standing crops, breaking the branches of the former and denuding them of their leaves, and, when the *bajra*, *jawar*, and maize are in ear, they hardly leave a single seed before they fly off in search of new pastures. They are, when fully grown, at first pinkish in colour, then they become yellowish, and finally brownish. They often wander about in the desert during the whole of the cold weather, resting on bushes in a semi-torpid condition during the night, and flying away to new ground during the day. In the second year they are generally active and lay eggs, but in the third they deteriorate in physique, and, in my opinion, do not produce eggs. They are then inactive, often hardly taking to wing, and when they rise only flying for a short distance. At this period they are diseased, and become the prey of birds and beasts, very soon after disappearing from the country completely. I saw the *Acridum succinctum* in the Deccan at Jalna in 1878, and I have no doubt that the variety met with in the desert here is distinct, viz., *Acridum peregrinum*, the locust of the Bible, which I once saw on board a P. & O. steamer in the Red Sea.

In the deserts of Marwar and Jaisalmir locusts are at times much used as food; they are relished by many of the people of these parts of the country, Mahomedans, Rajputs, and other castes. The saying is, that those fed on locusts daily grow visibly fatter and fatter. I have been through the desert in years when the great bulk of the population subsisted on locust and bread made from burnt grass-seed, and I found them well nourished. During the cold weather the locusts settle at night in the *bor*, *khair*, and mimosa bushes, and they

become semi-torpid with the cold, when they are easily caught in the early morning. The people throw blankets and clothes over them, and then push them into bags, or tie them up in bundles, and carry them off on camels to be eaten in the fresh state, or salted up in tiers in the huts for future use. They are boiled in salt water, curried, and cooked in other ways to suit tastes. Curry made from the fresh insect is not unpalatable to the hungry traveller. In years of scarcity the unwinged locusts are also eaten, but in years of plenty only the mature insect is used for the table, and even these are never so much in use when grain is abundant, although they are considered a delicacy when they first come in.

The people of these States are generally averse to destroying life, and even flesh-eaters become, from associations, averse to killing more than is necessary; consequently, little is done against invasions of locusts. The people have an idea that a locust year will always be one of abundant harvest, and that the little taken away by these insects will not be missed; a year of flies is also always expected to be a year of abundant crops. With regard to locusts, the idea is sometimes fallacious, as I have seen them take away the whole *bajra* crop just as the seeds were forming, leaving the stalks standing, but of little or no use for cattle, as they absorb so much nitre from the soil when thus early denuded of their millet that they are unwholesome as fodder. On the other hand, locusts are mostly abundant in years when the crops are good, and they sometimes leave enough to give a bumper harvest. At times they only top-dress the *bajra*, so that it sprouts unusually when the rain falls seasonably, and produces many stalks, which, in due course, grow into fine heads of millet. The husbandman then reaps many hundredfold more than he otherwise would have obtained by his own industry.

The population of the desert is sparse, and the number of locusts to be dealt with prodigious; nevertheless, much

could be done to mitigate their ravages if the people had their hearts in the work of extermination and began it early. The eggs could be dug up and destroyed, and the larvæ could be entrenched, burnt, and beaten to death. However, many of the villagers would rather starve than take part in a campaign of destruction such as that recognised, and the most that they do is to drive the young larvæ away from their fields, with brooms made of twigs, and shout at the flying insects in the hope of making them alight in another's field instead of in theirs.

Driving larvæ into trenches and burying them has been found useful; but this measure should be early adopted to meet with success, as the active hopping young locusts are difficult to deal with in this way.

A cloth screen, from two to three feet high, made slippery at the top, with a bit of oil-cloth (as used in Cyprus), might be found a useful addition to the trenching system, to direct into and retain the larvæ in the trenches.

Driving the young into lines of burning straw was found efficacious in Madras, and beating with besoms of twigs was considered the best way of destroying them in Bombay. Bags with openings at the side have been successfully tried; the young larvæ are driven into a bag eight or ten feet long by five or six wide, which is then twisted until they are killed.

Poisoning with arsenic has been found successful in dealing with locusts in Argentina, and it can be done with dilute solutions which would not be injurious to man or animals; it is, therefore, not attended with any danger, and it is also inexpensive. The necessary mixture is made by heating four gallons of water to boiling-point, and then adding one pound of caustic soda to which one pound of arsenic is added. The mixture should be well stirred and boiled for a few minutes, care being taken not to inhale the fumes, which are poisonous. Half-a-gallon of this mixture should be added to four gallons

of treacle and well mixed. Should treacle not be available, ten pounds of brown sugar mixed with four gallons of water will do instead. The dilute mixture should be thrown about the fields with a large whitewash brush, or *bajra* stalks could be dipped in it and then scattered for the locusts, which are attracted from considerable distances by the treacle. They eat the mixture with great avidity and die, and are eaten by their fellows, which die also; and this goes on until they are exterminated. The treacle mixture would have a strength of a little less than one grain of arsenic to the ounce of mixture, so it could not injure man or animals when scattered about the fields as directed above.

Dr. Edington, of Cape Colony, has cultivated a fungus which is very destructive to locusts, and which grows rapidly in the dead bodies of the insects, so that if they be thrown about where locusts feed, the disease is rapidly disseminated and the flights destroyed. The natives collect the dead insects, keep them in heaps for four or five days, when the fungus has fully developed throughout their bodies; they are then ground up and the meal mixed with sugar and water and placed on healthy locusts captured for the purpose, which are again set free to spread the disease among the flights throughout the country. The artificially cultivated fungus is distributed in tubes, and it is sufficient to break the tubes under shade and keep the place damp for the infection to spread to the flights of locusts about. The tubes are also broken in water and locusts dipped in the mixture, when they carry it away to their fellows, and thus spread the disease. This method is the most natural that has yet been adopted against locusts, and it should, if properly carried out, be sufficient to protect this country against them.

I am indebted to Rao Bahadur Pandit Sukhdeo Pershad for the following account of the operations carried on against locusts in Marwar during 1898:—

Last year particular attention was given to remedial measures, which consisted of dealing with (1) eggs, (2) larvæ, (3) full-grown flying locusts.

On the 29th July a flight of locusts passed over to Baru near Jodhpore. They alighted at 5 P.M., and flew away after depositing eggs on the following morning. The area on which they rested during the night consisted of drifting sand and sandy ground with some grass roots and mimosa shrubs. The insects avoided the drifting sand and deposited their eggs in the stable ground. For purposes of observation the area containing the newly-laid eggs was divided into four sections. The first was ploughed deeply to prevent the hatching of the eggs, but without any very marked effect, although many of the eggs must have been injured and disturbed. Nevertheless, numbers of larvæ came out of this portion of the ground in a healthy condition. The second division was allowed to remain undisturbed, and hatching on a complete scale took place in it. The eggs were dug up and destroyed from the third section; however, this process proved very tedious and impossible for a large area. The fourth section was flooded with water without effect, as larvæ came forth from it in great numbers.

The larvæ came out on the 10th of August, and soon began to hop about, eating up the blades of grass then sprouting. In order to ascertain how they would be affected by want of air, trenches, six, nine, and twelve inches deep, were dug and larvæ buried in them. The trenches were opened twenty-four hours afterwards. With the exception of a few which had been injured and killed in the act of burying, they were all alive. This experiment was repeated, and it was found that about forty-eight hours elapsed before they died under this process.

Deeper trenches were dug and larvæ driven into them by the villagers. The trenches were half filled, and sand was

then thrown on them to keep them down. Larvæ were driven into heaps of dry thorns and burnt. Both these methods were effectual, and they could be readily carried out by the villagers. However, lack of co-operation on their part is the principal drawback to prosecuting this plan of extermination.

A solution of one pound caustic soda and one pound arsenic in four gallons of water was prepared over fire. Half-a-gallon of this liquid, mixed with four gallons of water and ten pounds of unrefined sugar (*jaggree*), was sprinkled over shrubs and grass in the affected area, in the hope that the locusts would eat it, die, and then be devoured by their fellows while any remained unpoisoned. This method succeeded well in a cage in which captured locusts were confined. but it did not answer the purpose in the open plains, as the free insects were not much attracted by the sweetened poison, and their fellows did not wait to devour them after they did.

Rectangular pieces of cloth, twelve inches by three inches, were held erect, with the lower edges touching the ground, and the locusts driven into them and killed by twisting the cloths. This system was fairly satisfactory, and as it requires only two men and a piece of cloth it is very easily worked.

The locust-catcher, as used by the Agricultural Department, was successfully tried; but it was found that if the bullocks were yoked close to the bag they diverted the larvæ from it, and to overcome this traces of twenty-five feet were necessary. This apparatus consists of a log of wood on wheels, drawn by bullocks, with twigs inserted into it to sweep the insects into a long bag attached in front of the log. When the bag fills it is taken off and the larvæ destroyed.

Fires were lighted at night to attract the young locusts, but this scheme was unsuccessful.

Dr. Edington's fungus was obtained and cultivated. It

was put into water, and mature locusts captured and dipped into the solution, after which they were allowed their liberty; but they died without following up the flight to which they were intended to carry the contagion.

The natural enemies of locusts in this part of the country are very minute weevils, which perforate their eggs and remove the fluid from the shells; ants, which attack, disable, and devour larvæ; crows, kites, and other birds which subsist on them while they remain in the country, and follow them up for long distances. The adjutant (*Leptoptilus argala*) is the most formidable enemy of these insect pests. These birds encircle flights and crawling swarms of locusts, drive them together in huddled masses, and then devour them with great avidity. Damp is the natural enemy of the locust, and a damp season is always fatal to their existence in the desert, as it produces disease among them which soon exterminates the flights.

Gryllidæ (grasshoppers), *Achetidæ* (crickets), and *Blattidæ* (cockroaches), of which there are several varieties of each species, belong to this order. The two latter are very destructive in Indian houses, and should be kept down with arsenic, which they readily eat if it be mixed with dough. They have a great dislike to Nīm (*Melia indica*), and if the leaves of this tree be packed with clothes, they protect them against destruction by these troublesome domestic pests and their larvæ. *Mantis religiosa* (the praying mantis) is a familiar insect of this order, which visits when the night-lights are up, and rids the bungalow of many winged intruders.

Order APHANIPTERA (*Sarcopsylla penetrans* or *Pulex penetrans*, the Chigre or Chigoe).

The chigoe, vulgarly called "jigger," is a species of flea, which passes part of its existence on the ground like other fleas, but the female of which penetrates into the feet, gene-

rally under the toe-nails, where, producing its eggs, it swells out to the size of a pea, and lives by suction from the tissues in which it is embedded. It is difficult to detect at first, but it must be completely dug out of the tissues when it is discovered, without breaking the egg sac, otherwise diffuse inflammation follows. This insect is at present attracting much attention on account of the rapidity with which it is spreading, and the trouble which it is giving in Africa. It was introduced into Africa from the West Indies, and is rapidly overrunning the whole continent. It has lately been seen in Bombay, in coolies returned from Africa, and it attacked some of the Bombay sepoys recently on service in Mombassa. Great precautions against its importation into India are necessary, as the climate would suit it, and it would certainly spread rapidly throughout the country if introduced, giving rise to much suffering both in man and animals. The *Sarcoptes hominis* or *Acarus scabiei* ("itch mite") is the only other insect which behaves in the same way as the chigoe. However, it is more easily dealt with, and it does not spread rapidly under ordinary precautions and cleanliness. In this case, too, the female penetrates under the skin, but she differs from the other in laying her eggs in the burrow she makes.

A species of Pulicidæ (*Pulex irritans* or common flea) is found in many large towns in India; but it sticks in the skin only till it has satisfied its hunger, and therefore is not formidable. Most of this family feed and move on. They can be kept out of houses, even in the hills, with proper attention to ventilation, sunlight, and cleanliness.

Order Hemiptera.

This order is represented by one of the most undesirable of domestic pests—*Acanthia lectularia* or *Cimex lectularius* (the bed-bug), for which Keating's powder is occasionally

necessary, especially in the hills, where it is difficult to keep under in the rains when sunlight is often wanting, as the houses are then shut up to keep out the damp.

Coccus cacti (the cochineal insect) of this order may be seen during the monsoon season. It is used in medicine and the arts as a colouring agent.

Associated with the Hemiptera are *Pediculi* (lice), a degraded and aberrant group, which formerly were classified as a distinct order, the *Anoplura*. They eschew cleanliness, and should not be known "in places sacred to neatness and repose."

Order Diptera.

The genus *Culex* of this order is formidably represented in mosquitoes, gnats, and sand-flies, of which there are many varieties here. The mosquito has always been a troublesome lodger; but since Ross has placed on it the onus of harbouring the malarial plasmodium, and implanting fever poison in the human system, it has become a more dreaded foe, and greater interest has been added to the study of its life and habits.

Simulium nocivum, the sand-fly, is a worse biter in the desert than the mosquito, but its attacks are not followed by any serious consequences. The spotted-winged mosquitoes of this country and *Anopheles clavigar* of Italy are the dangerous varieties of the species. However, it is well to avoid being bitten by any of these blood-sucking enemies of mankind, especially in warm climates, where there is rarely any superabundance of the vital fluid in the body. The use of mosquito curtains is therefore recommended as a protection both against fever and disturbed rest, especially for the young and unseasoned.

Musca domestica (the house-fly), *Musca vomitoria* (the blue-bottle-fly), *Hippobosca equina* (the horse-fly), *Gasterophilus equi* (the bot-fly), *Œstrus ovis* (the sheep-fly), and *Œstrus bovis* (the cattle-fly), are all of the Diptera order and common pests here. Bots, due to the eggs of *Gasterophilus equi*, are common

in horses, and are best treated by the seeds of the Dhak tree (*Butea frondosa*), ground up and administered with the food. Good sanitation is the best remedy against house-flies, and carbolic acid or phenyle sprinkled about poisons some of them; also mixtures of arsenic and sugar, and quassia and sugar, when fly-papers are not available.

Order Hymenoptera.

Apis indica.

There are three well-known varieties of bee in these States. The most common, *Apis indica*, resembles *Apis mellifica* of Europe, and is found in large colonies in trees, attached to rocks, and occasionally in holes in walls. A larger variety of bee, which frequents the hills away from dwellings, is darker in colour, and builds mostly in rocks, where it is difficult to approach, both on account of its fierceness and the inaccessibility of the position it usually selects for its habitation. The third variety is very small, and found mostly in banyan trees at the foot of the hills, often close to villages. The large bee is by far the most fierce; it will attack almost without provocation, and, once it is roused, follow up its victim for long distances, stinging fearlessly until it leaves its sting behind. The best way to avoid bees is to get into a green bush, when they quickly desist from their attack. All the varieties here store up honey in considerable quantities, and combs can be found in good condition in May and June, and also in October and November. The honey is, however, sometimes coarsely flavoured, especially that stored on rocks by the larger black bee. This honey is sometimes even said to be poisonous when collected from certain flowers. The best honey is found on branches of trees, and it is sometimes of very fine flavour. The Bhils take it away during the night, or by smoking out the hive with burning grass on a pole. Honey is

sometimes offered for sale at Abu, and it is exported from some villages adjacent to the hills. The smaller varieties of bee could be cultivated and improved; but they produce a good deal of honey without trouble, and the people here are satisfied with a little without labour. The large bee is too fierce for domestication. It has been found more profitable to import Italian bees than to domesticate any of the wild varieties of India, and no attempt has been made at bee-farming in these States. The Bhils, however, collect much of the honey both for sale and domestic use, and it is largely used in country medicine here.

Many of the most disagreeable flying insects belong to the Hymenoptera order, such as *Vespa indica* (the Indian wasp), *Vespa crabro* (the hornet), *Formica fuliginosa* (the black ant), *Formica sanguinea* or *rubra* (the red ant), also varieties of *Cynipidæ* (gall-flies), *Siricidæ* (saw-flies), &c.

Neuroptera.

This order is well represented here, and the best known and most troublesome are the *Termites* or white ants. *Perlidæ* (stone-flies and many water-flies useful for fishing), *Libellulidæ* (dragon-flies, some of which are very handsome), belong to this order. White ants are so very destructive that they require to be kept down, and arsenic is the best remedy. It should be put under the plaster in houses where these troublesome pests come up through the floors and walls, as the drug is poisonous and irritating to the eyes and bronchi if inhaled with dust, which must occur if it be left on the surface. White ants will not attack the wood of the Nīm tree (*Melia indica*) until it becomes very old and decayed, and wood saturated with salt-water, creosote or tar is also unpalatable to them. Kerosine oil keeps them back for a time, and it is also a good remedy against black ants (*Formica fuliginosa*), which sometimes invades Indian houses in the rains.

LAC

Coccus Lacca (the Lac Insect).

Order HÆMOPTERA.—*Sub-Order* MONOMERA.—*Family* COCCIDÆ. (Scale Insects.)

THROUGHOUT the Aravallis and fertile lands in the neighbourhood of the hills of these States there are many trees which grow with sufficient vigour to support the lac insect (*Coccus lacca*). The intensity of the hot weather, the long dry season which follows the monsoon, and the frost, which is always considerable in December and January, are unfavourable to the cultivation of lac here, as the insects are sensitive to both intense cold and great heat, and they require some moisture in the air to enable them to work vigorously.

Two attempts have been made to introduce the lac insect into the forests of the Aravallis, but without success. However, a third effort will shortly be made, as it is believed that, if once well established, it could surmount all difficulties and produce lac of good quality.

The lac insect was obtained from Rewa and placed on 250 Dhak trees—*Butea frondosa*—in November 1895. About 2000 twigs, received with incrustations on them, were made up into bundles of six or seven each, and fixed to the crowns of trees which appeared sufficiently vigorous to support the insect. This was done at the right time, viz., when the larvæ were about to come out, and, by the end of a week, the young insects had all left the incrustations and fastened themselves on to the bark of twigs by means of their proboscides. The

insects did not show much power of locomotion or desire to take up new fields; they attached themselves to new twigs in contact with the old ones, and many of them were observed to perish in the struggle for existence on account of having remained too near home. Once they had fixed their suckers into the bark, they had to remain there permanently, and those which failed to obtain a good position perished from inanition. Before the larvæ left the incrustations of their mothers they sucked up all the red colouring matter, leaving only a dessicated, colourless film behind.

By the end of a month the surviving larvæ had grown considerably, and their bodies had become distended. The three filaments, essential to the female for respiration, excretion, and fecundation, had grown long, and lac incrustations began to be formed, so everything seemed to be doing well. Some of the shoots on which the insects were fixed were, however, killed by frost in December and January, and the insects perished with them. The hot weather of May and June dried up some of the incrustations, and reduced the stock still further. Then ants and monkeys devoured many more, leaving very little prospect of a reward for the labour bestowed on the enterprise. The males of the survivors developed wings, and new larvæ appeared in July; but the crop was far from an abundant one. The insect found its way accidentally on to a pipal tree (*Ficus religiosa*), and larvæ developed on it simultaneously with those of the other trees; but some of them were brilliant red, while others were yellow, as if they were in a more advanced stage than those bred on other trees. A planting out on fresh trees of some of the larvæ bred in Marwar was effected in July 1896, but they were mostly washed away by the heavy monsoon rains before they had become firmly fixed to the bark of the young shoots taken up by them, and what remained of them died during the frosty weather which ensued in December and January

The experiments of both years failed, and although some of the imported larvæ developed and produced lac, it was not in sufficient quantity to admit of twigs being rolled and the wax clarified to ascertain if it were of good quality. Both the seasons in which the experiments were made turned out unfavourable; the winter frosts were unusually severe, and the monsoon set in untimely for the planting out of the home-cultivated larvæ.

The following are the trees that have been set apart for lac cultivation in Marwar, viz., Dhák (*Butea frondosa*), Ber (*Zizyphus jujuba*), Babul (*Acacia arabica*), Sal (*Shorea robusta*), Khejra (*Prosopis spicigera*), Bur (*Ficus indica*), Gular (*Ficus glomerata*), Khair (*Acacia catechu*), Karunda (*Carissa carandas*), Pangara (*Erythrina indica*), and Am (*Mangifera indica*).

Besides the ordinary writing-table and office application of lac, it is largely used in these States for colouring wooden toys and other woodwork, also for making wrist and neck ornaments for women and for ornamenting idols.

LEPIDOPTERA

RHOPALOCERA or Butterflies, of which the following are the best known:—

List of Butterflies collected by the Boys at the Railway School, Mount Abu.

1. Royal Emperor.
2. Common Emperor.
3. Royal Tiger.
4. Bengal Tiger.
5. Tortoise-shell Tiger.
6. Tiger.
7. Peacock.
8. Two-tailed Peacock.
9. Four-tailed Peacock.
10. Tibetian Peacock.
11. Rose Peacock.
12. Mourning Peacock.
13. Limey.
14. Two-tailed Limey.
15. Four-tailed Limey.
16. Wilkinson's.
17. Eggie Wilkinson's.
18. Eggie's.
19. Gentleman's Fancy.
20. Lady's Fancy.
21. White Orange Tip.
22. Yellow Orange Tip.
23. Yellow.
24. Zebra.
25. Mangoe.
26. Bluebell.
27. Dumb-bell.
28. Spotted Bell.
29. Bare Back.
30. Rocky.
31. Scarlet Tip.
32. Salmon Tip.
33. Charcoal Tip.
34. Asia Tip.
35. Swallow Tail.
36. Glassy.
37. Cartridge.
38. Brown Cartridge.
39. Sailor.
40. Brown Sailor.
41. Tortoise-shell.
42. Brown Tortoise-shell.
43. Cabbage.
44. Curry and Rice.
45. Red Sky.
46. Blue Sky.
47. Tibetian.
48. Bouncer.
49. Olive.
50. Leopard.
51. Cheetah.
52. Pepper and Salt.
53. 1st Class Watcher.
54. 2nd Class Watcher.
55. 3rd Class Watcher.
56. Silver Leopard.
57. Macaroni.
58. Blotted Olive.
59. Olive Leaf.
60. Devil.
61. Evening Leaf.
62. Map Butterfly.
63. Oak Leaf.
64. Coffee.

List of Moths (Heterocera) collected by the Boys at the Railway School, Mount Abu.

1. Common Moth.
2. Atlas Moth.
3. Moon Moth and Half-Moon Moth.
4. Korunda Moth.
5. Death's Head.
6. Cottage Moth.
7. Wall Moth.
8. Ash Moth.
9. Charcoal Moth.
10. Bark Moth.
11. Silkworm Moth.
12. Brush-tailed Moth.

Bombyx mori, the silkworm moth, is met with on Mount Abu and in some of the other hills, and it would be possible to cultivate it here. However, the dry season is so prolonged that it might not be a profitable enterprise.

Arachnida.

Spiders (*Arachnida*), like lizards, are great benefactors in the house, as they rid it of many noxious insects, such as flies, mosquitoes, and gnats. Spiders are considered lucky here, as in Europe, and the people of the country always protect them. The tarantula (*Lycosa tarantula*), a large species of spider found in Indian houses, is a useful insect for keeping down noxious vermin, and it will even attack and devour scorpions. It only bites when hurt, and its bite is not poisonous, so it should not be injured.

Belonging to the same class, but very different in habits from spiders, with which they have little in common structurally except four pairs of legs, are the following parasites of the order *Acarina* or *Monomerosomata*:—*Sarcoptes hominis* or *Acarus scabiei* (the "itch" mite of man), *Acarus communis* (the dog-tick), *Acarus major* (the cattle-tick), *Acarus equus* (the horse-tick), and *Acarus ornothis* (the fowl-tick). All are common here. Except *Acarus scabiei* (which requires special treatment), they are easily kept down by lime-washing, frequent

renewing and burning of the floors of houses occupied by domestic animals. Kerosene oil, also, is a good application, and it should be rubbed into the woodwork of fowl-houses to destroy these pests.

Helminthology.

The parasites which inhabit the alimentary canal of man and the lower mammalia are not wanting here. Most of these obnoxious Entozoa find their way into the system through food and water, and several of them exist in meat in a larval or immature state. Some of them are encysted in a membranous or calcareous covering. This enables them to resist high temperatures, and to remain potent for evil after the cooking of the meat, in which they lie dormant till they have been liberated by the action of the gastric juice, when they begin a new period of activity.

Cestoidea, or Tape-Worms.—There are three varieties of this species, viz., *Tænia solium*, *Tænia mediocanellata*, and *Bothriocephalus latus*. The larvæ of the first-named variety, *Tænia solium*, is derived from pigs' flesh. The pig eats up the eggs with garbage; they are acted on by the gastric juice, which dissolves the capsule and liberates a minute proscolex, which bores its way into the blood-vessels of its host, and gets carried to a suitable nidus in the tissues. It develops further into the *Cysticercus cellulosæ* or "measle" of pork, and remains encysted until it is liberated by digestion again, after which it grows into a tapeworm and remains a parasite in the intestines. The larvæ of the second variety, *Tænia mediocanellata*, is found in the flesh of the cow; and of the third, *Bothriocephalus latus*, in fresh-water fish. Both these varieties go through much the same stages of existence as the *Tænia solium*.

Nematoda, or "Round" and "Thread Worms."—There are four well-known varieties of these parasites, viz., *Ascaris lumbricoides*, *Oxyuris vermicularis*, *Trichocephalus dispar*, and

Anchyolostomum duodenale. The life-history of these parasites is not so well known. The ova may, in some instances, be taken into the stomach in vegetable food or water, and in others there may be an alternative host for the first stage of development.

Trichina spiralis.—This parasite develops in the alimentary canal after the ingestion of pigs' flesh containing the encysted embryos. A young brood is produced, and these larvæ find their way through the circulation into the muscles, where they become encysted after they have injured much of the muscular fibre.

Filaria sanguinis hominis.—This worm is found in the human blood and lymphatics, where it gives rise to a group of diseases resembling elephantiasis, not often seen here. The embryo of this nematode is found only in the blood-vessels of the skin during the night; and it has, in consequence, been named *Filaria nocturnis.* This entozoon, like many of the others, requires an intermediate host, and Dr. Manson has demonstrated that the mosquito acts in this capacity, to facilitate the full development of the parasite. The mosquito draws up the Filariæ with the blood it sucks, and enables it to return to the water, where it dies, thus acting as a temporary host during its lifetime, and providing for their further existence by dying in the water, which is a suitable medium, after their liberation from the mosquito's body.

Filaria medinensis (*Guinea-worm*) is a common parasite in these States. The larva finds its way into the body through water, most probably drinking-water. The female develops to a considerable length in the areolar tissues of the body, mostly of the legs. She produces young, and then endeavours to gain an exit through the skin for her offspring, after which she dies if left in the body, producing much irritation and inflammation of the tissues in which she is embedded. When free, the larvæ seem to exist in water for a time. But it is

believed that they have alternative hosts in fresh-water crustaceans; and, like some of the other parasites of this class, they pass through one or more metamorphoses.

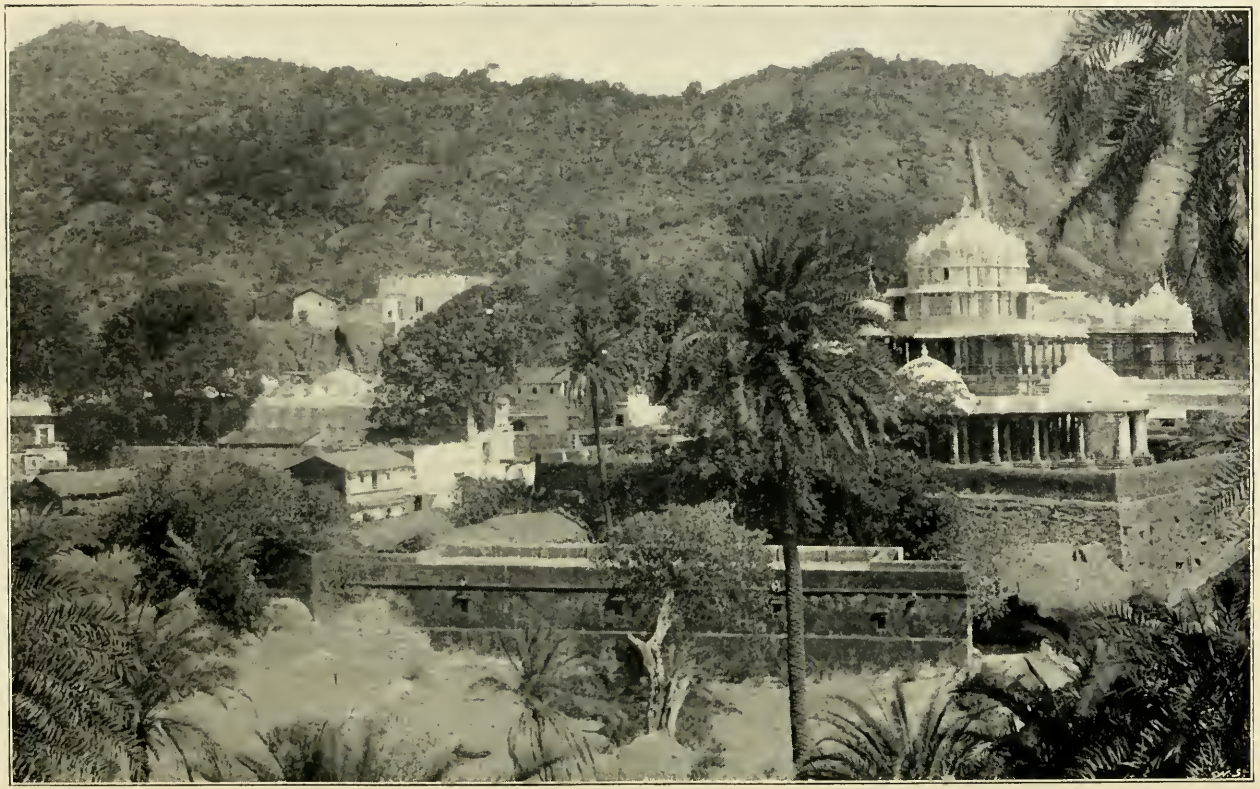
Trematoda or "Flukes."—These parasites pass through a complicated metamorphosis, varying with the host they occupy and the conditions about them. They exist in various forms in water, mammals, birds, batrachians, fishes, and mollusks. They gain access to the system through food and water, and are capable of producing a diseased condition in man and domestic animals. Flukes infest sheep, and may be communicated to man from the flesh of these animals, especially the liver and kidneys. Some authorities believe that they gain admission through bathing water.

Vegetable Parasites.

Man and the lower animals are subject to attacks from vegetable parasites, often fungi of a very low type, which generally destroy the hair follicles and epithelial scales for their own nutriment. There are three well-known varieties of fungus which produce ringworm and allied diseases, viz., *Trichophyton tonsurans, Microsporon furfur* and *Achorion shonleinii.* Baldness is produced by a fungus, too, but it has not been satisfactorily isolated; and there are many other degenerations due to low vegetable formations in the tissues. Indeed, every disease is now reasonably believed to have its microbe, and even old age is supposed by some to be brought about by a special coccus or bacillus. Bacteria, cocci, spirilla, bacilli, and other microbes, which find their way into the blood and tissues of man and animals, all belong to the vegetable kingdom. They observe the usual laws of Nature, and reproduce each after its kind. Thus cholera is caused by a distinct bacillus, bubonic plague by a cocco-bacillus, and tuberculosis by a microbe which is as different from the two former as the leek is from grass

and the snowdrop. No two of these vegetable micro-organisms act alike in the blood and tissues; consequently the diseases produced by them vary very much in character and acuteness. Many of the microbes of disease have an independent existence in air or water, and some can subsist on food stuffs, both animal and vegetable. When they gain admission into the tissues and blood, they mostly take on marked activity, multiply rapidly, and reduce the vitality of their host, at the same time producing a rise of temperature by their action. They assimilate from any suitable medium in which they can thrive, and produce ptomaines or poisons in return. When the soil becomes exhausted, they form spores or seed, and lie dormant or die if they cannot obtain access to new fields or suitable resting-places. Many of these microbes escape from their host through the excretions, and live under the same conditions in which they existed before they entered; here they rest until a new opportunity for activity is offered to them by another suitable host, and this goes on *ad infinitum*.

A study of the habits of parasites which infest man and animals will readily convince any one of the importance of a pure water supply and wholesome food. Meat that has been well cooked can hardly contain any larvæ capable of producing disease, as a very high temperature is fatal to both animal and vegetable life. Attention must, however, be given to the feeding of cattle from which milk is taken, and the flesh of animals which feed on garbage should be avoided, as it might readily be the means of communicating disease to man.



Jain Temples, Mount Abu.

To face page 397.

FORESTS AND FLORA

The eastern and some of the southern Parganas of Marwar, in the direction of the Aravalli Range, Jaswantpura, and Jalore, are well wooded with natural forest, and many of the ravines leading down into the plains from the hills produce timber of fair scantling. The hills and ravines of Sirohi are generally well wooded and some of them in the neighbourhood of Abu and Neemuch produce fine timber; while in the north and east of the State it is mostly undergrown. Jaisalmir and the north and north-west of Marwar, as well as Mallani and a large sandy tract of the south-west of the country towards the Rann of Kutch, produce nothing worthy of the name of forest, although belts of Khejra (*Prosopis spicigera*) are common throughout the sandy plains, and some of the more fertile valleys in the hard desert are well stocked with these trees. Cultivated topes of Nīm (*Melia indica*) are also met with at a great many of the villages in the less fertile parts of the country.

The following are the principal indigenous and cultivated trees, shrubs, and grasses found on and adjacent to the Aravallis and highlands of Marwar and Sirohi, including Mount Abu:—

TREES AND SHRUBS.

No.	Vernacular Name.	Botanical Name.	Natural Order.
1	Agia . . .	Girardinia heterophylla. (Stinging nettle.)	Urticaceæ.
2	Ajha . . .	Orthosiphon tomentosus. (A common herb.)	Labiatæ.
3	Ák	Calotropis procera. (Common flowering shrub of the desert.)	Asclepiadeæ.
4	Ák (big) . .	C. gigantea. (Bush)	Do.
5	Ám. . . .	Mangifera indica. (Tree)	Anacardiaceæ.
6	Amaltás or Karmála .	Cassia fistula. (Tree with handsome yellow flowers.)	Leguminosæ.
7	Amar Bel (Deathless creeper).	Cuscuta reflexa. (Leafless parasite) .	Convolvulaceæ.
8	Amarti (everlasting).	Celosia argentea. (A pink and white everlasting.)	Amaranthaceæ.
9	Ambartári .	Ærides affine. (Orchid)	Orchidaceæ.
10	Amrúd . .	Psidium pyriferum (Tree). . . .	Myrtaceæ.
11	Anár . . .	Punica granatum. (Pomegranate bush.)	Lythrarieæ.
12	Angir . . .	Ficus palmata. (An edible fig) . .	Urticaceæ.
13	Angur. . .	Vitis vinifera. (Vine-climber) . .	Ampelideæ.
14	Anjir . . .	Ficus carica. (A small tree) . . .	Urticaceæ.
15	Ankel or Ankol.	Alangium Lamarckii. (A small tree)	Cornaceæ.
16	Antera . .	Capparis grandis. (A small tree) .	Capparideæ.
17	Anwal or Awal.	Cassia auriculata. (Shrub)	Leguminosæ.
18	Aoula . . .	Phyllanthus emblica. (A middle-sized tree.)	Euphorbiaceæ.
19	Arand. . .	Ricinus communis. (Castor-oil plant)	Do.
20	Areta . . .	Sapindus trifoliatus. (Tree) . . .	Sapindaceæ.
21	Arjia . . .	Acacia eburnia. (Tree)	Leguminosæ.
22	Arrlua . .	Adhatoda Beddomei. (Shrub) . .	Acanthaceæ.
23	Áru . . .	Prunus persica. (Tree)	Rosaceæ.
24	Arusa . . .	Adhatoda Vasica. (Shrub)	Acanthaceæ.
25	Arwalia . .	Pueraria Stracheyii. (Creeper) . .	Leguminosæ.
26	Babul . . .	Acacia arabica. (Tree)	Do.
27	Bahera . .	Terminalia bellerica. (A fine tree) .	Combretaceæ.
28	Banokra . .	Hibiscus vitrifolius	Malvaceæ.
29	Bar. . . .	Ficus bengalensis. (The well-known Indian Banyan.)	Urticaceæ.
30	Bárkar Khanda.	Genus not determined. (Ginger plant.)	Zingiberaceæ.

No.	Vernacular Name.	Botanical Name.	Natural Order.
31	Barna . . .	Cratæva religiosa. (A medium-sized tree.)	Capparideæ.
32	Báus or Báns	Bambusa stricta. (The Bamboo) .	Gramineæ.
33	Bed . . .	Salix babylonica. (Weeping willow tree.)	Salicineæ.
34	Bhárka Dodi	Marsdenia tenacissima. (A twining plant.)	Asclepiadeæ.
35	Bharutia . .	Triumfetta tomentosa. (A plant) .	Tiliaceæ.
36	Bhendi . .	Hibiscus tetraphyllus	Malvaceæ.
37	Bhiri . . .	Urena lobata. (Herbaceous) . . .	Do.
38	Bhoi Rengni	Solanum xanthocarpum. (A prickly plant.)	Solanaceæ.
39	Bili, Bael, or Bilgir	Ægle Marmelos. (A tree)	Rutaceæ.
40	Biya . . .	Pterocarpus Marsupium. (A tree with shining pinnate leaves.)	Leguminosæ.
41	Bokna. . .	Commelyna (species unfixed). (A plant with bright blue flowers.)	Commelyneæ.
42	Bor . . .	Zizyphus Jujuba. (The bair tree) .	Rhamneæ.
43	Bhorli . .	Garuga pinnata. (Tree)	Burseraceæ.
44	Chá . . .	Camellia Thea. (Shrub—Tea plant)	Ternstrœmiaceæ.
45	Chambeli or Já.	Jasminum rottlerianum and J. grandiflorum. (Jessamine.)	Oleaceæ.
46	Champa . .	Michelia champaca. (A large tree) .	Magnoliaceæ.
47	Charr . . .	Pongamia glabra. (A moderate-sized tree.)	Leguminosæ.
48	Chir . . .	Pinus longifolia. (A large tree with symmetrical branches.)	Coniferæ.
49	Dántpara . .	Casearia tomentosa. (A small tree) .	Samydaceæ.
50	Dári . . .	Woodfordia floribunda. (A large shrub.)	Lythraieæ.
51	Datura . .	Datura fastuosa. (Thorn apple) . .	Solanaceæ.
52	Dhák or Palás	Butea frondosa. (A tree)	Leguminosæ.
53	Dháman . .	Grewia pilosa and G. tilæfolia. (A small tree.)	Tiliaceæ.
54	Dhámani . .	Sida humilis. (A trailing herb) .	Malvaceæ.
55	Do. . .	Waltheria indica. (A herb) . . .	Sterculiaceæ.
56	Dhau (Kantia).	Anogeissus pendula. (A small gregarious tree.)	Combretaceæ.
57	Dhaukra . .	Anogeissus latifolia. (A large tree) .	Do.
58	Dhaula bura	Buddleia Madagascarensis. (A large shrub.)	Loganiaceæ.
59	Dholi musli .	Sub-order Cypripedeæ (?). (Orchid.)	Orchidaceæ.
60	Dudheli . .	Holarrhena antidysenterica. (A small tree.)	Apocyneæ.
61	Enkra or Unt Kartalia.	Argemone mexicana. (A common bright yellow flower.)	Papaveraceæ.
62	Eucalyptus .	Eucalyptus Globulus. (A lofty tree.)	Myrtaceæ.

No.	Vernacular Name.	Botanical Name.	Natural Order.
63	Farás . . .	Tamarix articulata. (A tree) . . .	Tamariscineæ.
64	Gantia . .	Barleria cristata. (A low plant) . .	Acanthaceæ.
65	Gani . . .	Coix lachryma. (Job's tears—grass.)	Gramineæ.
66	Gatbor . .	Zizyphus xylopyra. (Wild bair shrub.)	Rhamneæ.
67	Gengria . .	Crotolaria sericea. (Plant)	Leguminoseæ.
68	Ghiyor(large)	Nymphea alba. (White waterlily) .	Nymphaceæ.
69	Ghiyor(little)	Lymnanthemum cristatum. (A small white aquatic flower.)	Gentianaceæ.
70	Ghor-bel . .	Pueraria tuberosa. (A common creeper on Abu.)	Leguminosæ.
71	Goi	Trema orientalis. (An evergreen tree.)	Urticaceæ.
72	Gold-mohur .	Poinciana regia. (A splendid ornamental tree.)	Leguminosæ.
73	Golra . . .	Odina Wodier. (Tree)	Anacardiaceæ.
74	Gonda . . .	Cordia Myxa. (A small tree) . . .	Boragineæ.
75	Gondi . . .	Ehretia obtusifolia. (A small tree) .	Do.
76	Gor jhár . .	Loranthus longiflorus. (A parasite) .	Loranthaceæ.
77	Grevellia . .	Grevellia robusta. (Tree)	Proteaceæ.
78	Gugal . . .	Balsamodendron mukul. (Tree) . .	Burseraceæ.
79	Gular . . .	Ficus glomerata. (A fig)	Urticaceæ.
80	Haldua . .	Adina cordifolia. (Tree)	Rubiaceæ.
81	Han-Rhiyo .	Loranthus longiflorus. (A large handsome parasite.)	Loranthaceæ.
82	Harsinghar or Dhári.	Nyctanthes arbor-tristis. (A small tree.)	Oleaceæ.
83	Hatto or Satto	Jasminum Sambac. (A jasmine) . .	Oleaceæ.
84	Haria . . .	Bidens pilosa	Compositæ.
85	Honeri . .	Jasminum humile. (Yellow jasmine)	Oleaceæ.
86	Ikarr . . .	Æschynomene indica. (A tallish herb.)	Leguminosæ.
87	Do. . . .	Smithia (?). (A small herb) . . .	Do.
88	Do. . . .	Cassia minosoides. (An erect herb) .	Do.
89	Jabardanti .	Striga orobanchioides. (A small leafless plant.)	Scrophularineæ.
90	Jal	Hiptage madablota. (A twining shrub.)	Malpighiaceæ.
91	Jal Nim . .	Polygonum glabrum. (Persicaria) . .	Polygonaceæ.
92	Do. . .	Polygonum	Do.
93	Jáman . . .	Eugenia Jambolana. (A handsome tree).	Myrtaceæ.
94	Jhil . . .	Limnophila gratioloides. (A small plant.)	Scrophularineæ.
95	Jojaru or Jajaru.	Crotolaria trifoliastrum. (A little yellow flowering plant.)	Leguminosæ.
96	Kachnár . .	Bauhinia racemosa. (The "geranium" tree.)	Do.

No.	Vernacular Name.	Botanical Name.	Natural Order.
97	Kadam or Kib.	Anthocephalus Cadamba. (A large tree.)	Rubiaceæ.
98	Kalia . . .	Albizzia odoratissima. (A large tree)	Leguminosæ.
99	Kait . . .	Feronia elephantum	Rutaceæ.
100	Kama . . .	Solanum nigrum. (A weed) . . .	Solanaceæ.
101	Kamboi . .	Phyllanthus reticulatus. (Shrub) .	Euphorbiaceæ.
102	Kámpéla . .	Mallotusphilippinensis. (A small tree)	Do.
103	Kaner . . .	Nerium odorum. (Oleander) . . .	Apocyneæ.
104	Kantela . .	Berberis aristata. (Shrub) . . .	Berberideæ.
105	Kanti . . .	Flacourtia Ramontchi. (Shrub) . .	Bixineæ.
106	Kanthal . .	Artocarpus integrifolia. (The Jack Tree.)	Urticaceæ.
107	Do. (small shrub).	Kanthal acanthus (?)	Acanthaceæ.
108	Kárá . . .	Strobilanthus callosus. (A shrub) .	Do.
109	Karja or Karoj.	Ulmus integrifolia. (The Indian Elm.)	Urticaceæ.
110	Karji . . .	Pongamia Glabra. (A small tree) .	Leguminosæ.
111	Kareli . . .	Lorenthus longiflorus	Loranthaceæ.
112	Karmálá . .	Cassia	Leguminosæ.
113	Karunda . .	Carissa Carandas. (A large shrub) .	Apocyneæ.
114	Katkaro or Kátekaro.	Vogelia indica	Plumbagineæ.
115	Katumbo . .	Vitis vinifera. V. latifolia. V. carnosa. (See Angur.)	Ampelideæ.
116	Keim . . .	Nauclea parvifolia. (A large tree) .	Rubiaceæ.
117	Kemla . . .	Anthocephalus Cadamba. (A large tree.)	Do.
118	Kerna . . .	Wrightia tinctoria. (Shrub) . . .	Apocyneæ.
119	Khajur . .	Phœnix sylvestris. (Palm tree) . .	Palmæ.
120	Khair . . .	Acacia Catechu. (A small acacia) .	Leguminosæ.
121	Kala dhau .	Anogeissus acuminata. (Tree) . .	Combretaceæ.
122	Khátárli . .	Oxalis corniculata. (Flower) . . .	Geraniaceæ.
123	Khátubo . .	Verbascum celsioides. ("Mullein").	Scrophularineæ.
124	Kharoti . .	Plectranthus rugosus. (A small under shrub.)	Labiatæ.
125	Kharaiyo or Kulu.	Sterculia urens. (A tree with white bark.)	Sterculiaceæ.
126	Khirní . .	Mimusops indica. (A large evergreen tree.)	Sapotaceæ.
127	Khejra . .	Prosopis spicigera. (A thorny tree) .	Leguminosæ.
128	Karakshia or Taramsi.	Cæsalpinia sepiaria. (A thorny pinnate tree.)	Do.
129	Kodala . .	Sterculia villosa. (A fine tree) . .	Sterculiaceæ.
130	Kolai . . .	Dichrostachys cinerea. (A small acacia-like tree.)	Leguminosæ.
131	Konr . . .	Hamiltonia suaveolens. (Shrub) . .	Rubiaceæ.
132	Kowes . . .	Mucuna pruriens. (Creeper) . . .	Leguminosæ.

No.	Vernacular Names.	Botanical Name.	Natural Order.
133	Kúja (Gulab)	Rosa involucrata and R. moschata. (White dog roses.)	Rosaceæ.
134	Kutri . . .	Acacia concinna. (A thorny shrub).	Leguminosæ.
135	Lilotri . . .	Evolvulus alsinoides. (A small creeping plant.)	Convolvulaceæ.
136	Maha nimbu	Citrus decumana. (Tree)	Rutaceæ.
137	Mál Kángni .	Celastrus paniculatus and C. stylosa. (Creeper.)	Celastrineæ.
138	Malla Singhi or Marora Phalli.	Helicteres Isora. (A large shrub) .	Sterculiaceæ.
139	Mathari or Matawal.	Sterculia colorata. (Tree)	Do.
140	Mendúl . .	Randia dumetorum. (A small shrub.)	Rubiaceæ
141	Mitha nimbu	Citrus lumia. (Tree)	Rutaceæ.
142	Mohwa . .	Bassia latifolia. (A large tree) . .	Sapotaceæ.
143	Mujál . . .	Casearia tomentosa. (A small tree) .	Samydaceæ.
144	Mulari . .	Vigna vexillata. (A pea)	Leguminosæ.
145	Mungia . .	Phaseolus mungo. (A plant) . . .	Do.
146	Nárangi . .	Citrus aurantium. (Tree)	Rutaceæ.
147	Negar . . .	Vitex negundo. (A small tree) . .	Verbenaceæ.
148	Nila . . .	Hemigraphis ebracteolata. (A small plant.)	Acanthaceæ.
149	Nim . . .	Melia indica. (A common tree) . .	Meliaceæ.
150	Nimbu . .	Citrus acida. (Tree or shrub) . .	Rutaceæ.
151	Pádia . . .	Hamiltonia suaveolens. (Shrub) . .	Rubiaceæ. (See Konr.)
152	Palki . . .	Ficus cordifolia. (Wild fig) . . .	Urticaceæ.
153	Pilihoneri .	Senecio saxatilis. (Flowering plant).	Compositæ.
154	Pipal . . .	Ficus religiosa. (A large plant) . .	Urticaceæ.
155	Phaludra . .	Erythrina arborescens. (The "Coral" tree.)	Leguminosæ.
156	Do.	Erythrina lithosperma. (Tree) . .	Do.
157	Pherwana .	Ipomea muricata. (A lilac convolvulus.)	Colvolvulaceæ.
158	Do.	I. hederacea. (A purple convolvulus)	Do.
159	Do.	I. Wightii. (A purplish-pink convolvulus.)	Do.
160	Do.	I. pes-tigridis. (A pink convolvulus)	Do.
161	Do.	I. obscura? (A yellow convolvulus, purple at base.)	Do.
162	Pomaria . .	Cassia Tora. (A tall plant). . . .	Leguminosæ.
163	Poptia . . .	Nicandra physaloides. (Flowering plant.)	Solanaceæ.
164	Do.	Physalis minima. (Herb)	Do.
165	Poptia Marua	Atylosia sericea. (A small plant) .	Leguminosæ.
166	Ratanjot . .	Jatropha curcas. (A small tree) . .	Euphorbiaceæ.

No.	Vernacular Names.	Botanical Name.	Natural Order.
167	Rengani . .	Solanum indicum. (A prickly shrub)	Solanaceæ.
168	Rohira . .	Tecoma undulata. (A tree with bright flowers.)	Bignoniaceæ.
169	Ságwán. . .	Tectona grandis. (A large tree) . .	Verbenaceæ.
170	Sál	Shorea robusta. (A large tree) . .	Dipterocarpeæ.
171	Sálaran . .	Boswellia serrata. (A large tree). .	Burseraceæ.
172	Salem Misri .	Ophrydeæ. (Orchid)	Orchidaceæ.
173	Sáler . . .	Boswellia thurifera. (Tree) . . .	Burseraceæ.
174	Sarw . . .	Cupressus sempervirens. (A tall tree)	Coniferæ.
175	Sasarda . .	Blepharis Boerhaavifolia. (A prickly herb.)	Acanthaceæ.
176	Sebla . . .	Bombax malabaricum. (Cotton tree)	Malvaceæ.
177	Seblia Kantal.	Barleria Prionitis. (A small shrubby plant.)	Acanthaceæ.
178	Seblia Kantal	Barleria cuspidata. (A prickly shrub)	Acanthaceæ.
179	Setut . . .	Morus nigra. (A middle-sized tree) .	Urticaceæ.
180	Sewan or Hawan.	Gmelina arborea. (A handsome tree)	Verbenaceæ.
181	Shisham . .	Dalbergia latifolia. (A large glabrous tree.)	Leguminosæ.
182	Shole-ka-saper.	Millingtonia hortensis. (Tree) . .	Bignoniaceæ.
183	Sirgura . .	Moringa concanensis. (The horse-radish tree.)	Moringeæ.
184	Siris . . .	Albizzia lebbek. (Siris tree) . . .	Leguminosæ.
185	Sirs-arro or Unda Kanta	Achyranthus aspera. (Plant) . . .	Amaranthaceæ.
186	Sitaphal . .	Anona squamosa. (Small tree) . .	Anonaceæ.
187	Sitráwal . .	Plumbago Zeylanica. (Shrub) . .	Plumbagineæ.
188	Tallo . . .	Cedrela Toona. (A tall tree) . . .	Meliaceæ.
189	Tatta Kaoni .	Petalidum Barlerioides. (A shrubby plant.)	Acanthaceæ.
190	Taowara . .	Impatiens balsaminia. (A balsam plant).	Geraniaceæ.
191	Taransi . .	Cæsalpinia sepiaria. (A large prickly climber.)	Leguminosæ.
192	Tébran . .	Diospyros tomentosum. (Tree) . .	Ebenaceæ.
193	Tendu. . .	Diospyros melanoxylon. (Tree) . .	Do.
194	Umbia. . .	Saccopetalum tomentosum. (A round-fruited tree.)	Anonaceæ.
195	Umbro . .	Ficus glomerata. (A fig.) (See Gular)	Urticaceæ.
196	Undphulla .	Trichodesma indicum. (Plant) . .	Borragineæ.
197	Unt Kantalia	Argemone mexicana. (Flower) . .	Papaveraceæ.
198	Unda Kanta	Achyranthes aspera. (Plant) . . .	Amaranthaceæ.
199	Vangi or Deodri.	Lettsomia setosa. (Creeper) . . .	Convolvulaceæ.
200	Vavan. . .	Kydia calycina. (Tree)	Malvaceæ.
201	Vera . . .	Salix tetrasperma. (Willow) . . .	Salicyneæ.

GRASSES OF THE HILLS AND FERTILE LANDS.

No.	Vernacular Name.	Botanical Name.	Natural Order.
1	Baru	Sorghum halepense	Gramineæ
2	Bhangta	Opluda aristola	
3	Chhenki	Paspalum korá	
4	Dab or Kusha	Eragrostis cynosursides	
5	Dhaman	Pennisetum cenchroides	
6	Dób	Cynodon dactylon	
7	Karar	Iseilema laxum	
8	Khas	Khas oderiferus	
9	Lámp	Aristida hystrix	
10	Lanpla	Aristida depressa	
11	Munj	Saccharum sara	
12	Seran	Ischæmum laxum	
13	Surwala	Heteropogon contortus	

The following list includes the most important of the indigenous trees and shrubs met with in the sandy and hard deserts of Marwar and Jaisalmir. However, many of those given in the list of the fertile regions are found on the borders of the desert, and cultivated within desert limits :—

No.	Vernacular Name.	Botanical Name.	Natural Order.
1	Ak or Akra	Calotropis procera. (The Mudar shrub.)	Asclepiadeæ.
2	Aranja or Armajia.	Acacia leucophlœa. (Tree)	Leguminosæ.
3	Arni	Clerodendron phlomoides. (A large shrub.)	Verbenaceæ.
4	Babul	Acacia arabica. (Tree)	Leguminosæ.
5	Bajar bel	Cocculus villosus	Menispermaceæ.
6	Bakda	Mollugo hirta. (A plant)	Ficoideæ.
7	Bamburi	Euphorbia dracunculoides. (A much-branched shrubby plant.)	Euphorbiaceæ.
8	Ber, Bor, or Borti.	Zizyphus nummularia and Z. vulgaris. (Low thorny shrubs.)	Rhamneæ.

No.	Vernacular Name.	Botanical Name.	Natural Order.
9	Bhu bambli .	Acacia Jacquemonti. (A small bushy shrub.)	Leguminosæ.
10	Bisuni . .	Indigofera vulgaris. (A shrubby plant.)	Do.
11	Bui	Acrua javanica. (A shrubby white woolly plant.)	Amaranthaceæ.
12	Chirpotan .	Withania somnifera. (A tall shrubby plant.)	Solanaceæ.
13	Dabi . . .	Cadaba indica. (A shrub with small oval leaves.)	Capparideæ.
14	Damasha . .	Barleria acanthoides. (An erect prickly plant.)	Acanthaceæ.
15	Dhau . . .	Anogeissus acuminata. (A small tree.)	Combretaceæ.
16	Gangeran .	Grewia populifolia.. (Shrub) . . .	Tiliaceæ.
17	Goila . . .	Indigofera paucifolia. (A small shrub with woody branches.)	Leguminosæ.
18	Gondi . . .	Cordia rothii. (A shrub)	Borragineæ.
19	Hajeru . .	Mimosa rubicaulis. (A large, straggling, prickly shrub.)	Leguminosæ.
20	Hingota . .	Balanites roxburghii. (A small tree)	Simarubeæ.
21	Imli . . .	Tamarindus indica. (A large tree) .	Leguminosæ.
22	Jab	Salvadora persica and S. oleoides. (Trees.)	Salvadoraceæ.
23	Jawasa . .	Alhagi maurorum. (A small thorny shrub.)	Leguminosæ.
24	Kachri . .	Cucumis trigonus	Cucurbitaceæ.
25	Kair . . .	Capparis aphylla. (A scrubby bush)	Capparideæ.
26	Kankera . .	Gymnosporia montana. (A large shrub.)	Celastrineæ.
27	Kankeran .	Celastrus senegalensis. (A tall shrub)	Do.
28	Kerala . .	Momordica charantia. (A creeper) .	Cucurbitaceæ.
29	Khejra . .	Prosopis spicigera. (A tree sometimes large.)	Leguminosæ.
30	Khimp . .	Orthanthera viminea and Leptadenia spartium. (Shrub.)	Asclepiadeæ.
31	Korna . . .	Wrightia tinctoria. (Tree)	Apocyneæ.
32	Kumtia . .	Acacia rupestris. (A small tree) . .	Leguminosæ.
33	Kunrat . .	Dichrostachys cinerea. (A rigid thorny shrub.)	Do.
34	Lana . . .	Haloxylon salicornicum. (A small shrub.)	Chenopodiaceæ.
35	Lanka . . .	Euphorbia tiracalli. (A small tree) .	Euphorbiaceæ.
36	Morali . . .	Lycium europœum. (A thorny shrub)	Solanaceæ.
37	Nakchinkna .	Corchorus antichorus	Tiliaceæ.
38	Nagphani Thor	Opuntia dilleni. (The prickly pear)	Cacteæ.
39	Nim . . .	Melia indica. (The Neem tree) . .	Meliaceæ.

No.	Vernacular Name.	Botanical Name.	Natural Order.
40	Phog . . .	Calligonum polygonoides. (An almost leafless shrub.)	Polygonaceæ.
41	Pilwan . .	Cocculus leæba. (A large woody creeper.)	Menispermaceæ.
42	Rohira . .	Tecoma undulata. (A moderate-sized tree.)	Bignoniaceæ.
43	Rohwan . .	Bergia odorata. (A woody under-shrub.)	Elatineæ.
44	Sanesra . .	Poinciana elata. (Tree)	Leguminosæ.
45	Santra. . .	Santra Jaissalmiris. (Shrub) . . .	Capparideæ.
46	Tastumba .	Citrullus colocynthis. (A trailing plant.)	Cucurbitaceæ.
47	Thor . . .	Euphorbia royleana. (Shrub). . .	Euphorbiaceæ.
48	Thor (Chhoti)	Euphorbia nivulia. (Shrub) . . .	Do.

GRASSES OF THE DESERT.

No.	Vernacular Name.	Botanical Name.	Natural Order.
1	Bhurat or Burut.	Cenchrus catharticus	Gramineæ.
2	Murath or Makra.	Chloris roxburghiana	
3	Mothea . .	Mothea tuberosa	
4	Tantia or Sawan.	Eleusine flagellifera	
5	Dhâman . .	Pennisetum conchroides	

Much attention has, during recent years, been given to arboriculture in Jodhpore, and to the preservation and improvement of forests in the Aravallis, Mount Abu, and some of the other hills of Marwar and Sirohi. A small forest reserve has also been marked out in Jaisalmir.

Nim (*Melia indica*), Bakain (*Melia azedarach*), Siris (*Albizzia lebbek*), Âm (*Mangifera indica*), Jâman (*Eugenia Jambolana*), Shisham (*Dalbergia latifolia*), Sâgwân (*Tectona grandis*), Mohwa

(*Bassia latifolia*), Rohira (*Tecoma undulata*), and Manilla tamarind (*Pithecolobium dulce*) have all been recently cultivated successfully in the sands at Jodhpore, where they grow rapidly, when watered during the hot months. Extensive belts of Khejra (*Prosopis spicigera*) spring up rapidly in the sandy valleys of the desert without any other assistance than protection from camels, goats, and sheep. This tree should be fostered, as it is of the greatest service during years of scarcity, and if it were extensively protected, it might in time increase the rainfall throughout the dry zone, and settle the drifting sands, on which it has already had a good effect in the vicinity of Jodhpore.

The trees, shrubs, and grasses of the Aravallis and Mount Abu, and the fertile lowlands and low hills of Marwar and Sirohi adjacent are too numerous to be particularised in a work of this kind; so a description of only a few of the most important will be attempted, and the reader is referred to Miss Macadam's complete "Lists of Trees and Plants of Mount Abu, Marwar, and Jaisalmir" for further details.

Ám (*Mangifera indica*), the mango tree, is met with in the wild state on Mount Abu, where it is believed to have been introduced by pilgrims, who carried the fruit up and threw the stones about the rocks, where they grew into trees. It is also cultivated at many villages in the plains below Abu, and the Aravalli Range. The Abu mango is small and has a strong flavour of turpentine, like the wild mango of Africa; it is principally used for making *Chatni* preserve, or dried to form *Amchore*, an antiscorbutic of great repute, which is largely exported.

Amaltàs (*Cassia fistula*) is a moderate-sized tree, with beautiful racemes of yellow flowers, which come out in May and June, before its leaves. It looks like a laburnum in the distance; it is found in the lower ranges of Abu and the Aravallis. Its wood is not valuable, but the long pods are

exported, and their pulp also much used as a medicine throughout the country.

Areta (*Sapindus trifoliatus*), a tree with a two-lobed saponaceous fruit which is used as soap by the villagers; this tree is met with in the Abu hills and the Aravalli Range.

Ánwal or Áwal (*Cassia auriculata*), a shrub with yellow pea-like flowers, common in Godwar, parts of Sirohi and Jaswantpura; it covers large tracts and gives shelter to small game of all sorts. The bark is largely used for tanning, and exported for the same purpose; it is also used in the distillation of country liquor. Ánwal is said to be of Meywar, and Ák of Marwar, the former being the flower of the fertile lands below the Aravallis, the latter the pride of the sandy desert.

Aoula (*Phyllanthus emblica*), a fair-sized tree with feathery leaves and a yellow berry fruit, the pulp of which is made into jam when the seeds have been removed. The fruit is used medicinally, both in the fresh and dried state.

Arrlua (*Adhatoda Beddomei*), a shrub with white flowers, met with in the lower spurs of Abu and the Aravallis. Its leaves are used as poultices, and a decoction of them is taken internally in lung affections.

The Ambartari (*Ærides affine*) is a pretty little orchid which grows on the mango and jaman trees on Mount Abu. It comes out in the rains in great profusion; the flowers are offered at the temples, and the crushed tubes used as an application in skin diseases. A larger species of a somewhat similar orchid, is met with in the lower Sirohi hills; its flowers are bluish-white.

Amrud (*Psidium pyriferum* and *pomiferum*): both the white and red guava are largely cultivated in these States, and the fruit is met with in many of the bazaars throughout the country, as it is highly prized by the people.

Anar (*Punica Granatum*), the pomegranate tree, is cultivated

for its fruit and flowers; some of the fruit grown at Jodhpore is celebrated for fine quality and delicate flavour. The bark of this bush is used medicinally, and *sharbat* is made from the fruit.

Angir (*Ficus palmata*), a wild edible fig, found on Mount Abu, and some other peaks of the Aravallis.

Arand (*Ricinus communis*), the castor-oil plant, is cultivated in some places in Marwar and Sirohi, both for its shade and seeds, from which castor-oil is expressed for use in medicine and the arts.

Aru (*Prunus persica*), the peach tree, grows well on Mount Abu, and the fruit is of good quality when the tree is properly looked after and manured.

Babul (*Acacia arabica*), a tree with straight, white thorns, mostly in pairs, having round yellow flowers which eventually produce small beans, is met with at at every village in the fertile country below Abu and the Aravallis, and at many of the wells and tanks in the western desert. The Babul is one of the most useful village trees; the leaves, shoots, and pods provide fodder for the herds and flocks of the people, in the hot weather when pasture becomes exhausted; the wood is used for domestic and agricultural purposes, and the bark for tanning and dyeing; the gum which exudes from the tree is exported and also used medicinally in various ways; and the leaves are pounded up into a poultice, and applied in the treatment of ophthalmia, for which they are believed to be potent.

Bahera (*Terminalia bellerica*), a fine tree of the Aravallis and Mount Abu; its fruit is exported for dyeing and used medicinally.

Bar or Banyan tree (*Ficus bengalensis*) is met with in the east and south of Marwar, along the Aravallis, and it is common in the Sirohi State. The fruit of this tree attracts bears and green pigeons for the sportsman. It sometimes

covers large areas, and one tree will afford shade for a considerable camp.

Baus or Bans (*Bambusa stricta*), Bamboo, is abundant in the Aravallis, Abu, and the other hills in Eastern Marwar and Sirohi; it is much used for domestic purposes, and decoctions of its leaves are used for coughs and lung affections.

Bili, Bael, or Bilgir tree (*Ægle Marmelos*) is met with about Anadra, the base of Mount Abu, and some of the lower Aravallis; a few trees are found also on Abu. The leaves are offered at temples, and the fruit is in general use in the treatment of dysentery and bowel affections, in which it is an excellent remedy, especially in the fresh state. The pulp of the fruit should be boiled and the gelatinous material strained and sweetened. It is not unpleasant as a jelly or sharbat, and it keeps well in the jelly form, retaining its curative properties. It is exported to Europe for medicinal purposes.

Bed (*Salix babylonica*).—This Willow is cultivated on Mount Abu to a small extent, and one or two wild species are met with in some places near streams in these States.

Anjir (*Ficus carica*), the fig-tree, grows at Abu and in some other favoured places in these States, and the Abu fruit is of good quality. Wild figs are plentiful and large, both in Abu and the Aravallis.

Chá (*Camellia Thea*).—There is one tea plant on Mount Abu, in the compound of the railway bungalow. It is now about twenty-five years old; it is still well grown and fresh, and the leaves have the characteristic odour of tea; it seeds regularly, but no new plants have sprung up around it. It is believed that the long period of dry weather would prevent the successful cultivation of tea for the market on Mount Abu.

Chambeli or Ja (*Jasminum rottlerianum* and *J. grandiflorum*).—Both varieties of Jasmine grow wild in the ravines

of Abu and some other adjacent hills. The flowers of these varieties are offered at the temples, and the leaves are believed to be potent remedies for herpes of the lips and ulcers of the mouth and tongue.

The Champa (*Michelia champaca*) is a large tree with highly-scented yellow flowers, wild, and often cultivated near temples on Mount Abu and in many other places throughout these States: the flowers are much used for garlands, and the wood is considered the best for the manufacture of string musical instruments.

Chir (*Pinus longifolia* and *Deodara*).—A few of these trees have been imported from Europe and Simla and planted near the Residency, Mount Abu, where they have grown, but not to a very large size.

The Dhak or Palás tree (*Butea frondosa*) is abundant in the lower ravines and valleys of the Aravallis, Abu, Jaswantpura, Jalore, and other places in these States. Its beautiful bloom of red flowers lights up the country in March, and it looks well when its new leaves are out; but at other seasons it is ugly and broken down in appearance. The seeds are given to animals as anthelmintic medicine, and the leaves are used for boils and swellings. The leaves are also used as plates for curries and other foods.

Dhâman (*Grewia pilosa* and *G. tiliæfolia*).—Two varieties of this small tree are met with in the hills. The leaves are much in use for feeding cattle during the hot weather when fodder and grass are scarce; milch cows do well on it. The fruit is eaten by the people, and the timber is valuable.

Dhau (*Anogeissus pendula*) is the most common tree of the lower Aravallis and lower ridges of Abu; it is also found in numbers on the top of the hills, but not so thickly studded together. A gum is collected from it which is used medicinally and also exported. The wood is largely used in agriculture and for domestic purposes. It has been tried for railway

sleepers; but it is so hard and brittle that it quickly spoils the boring instruments, and it cracks too readily to last when perforated with the iron pins necessary to fix the rails.

Eucalyptus (*Eucalyptus Globulus*) has been imported from Australia, and a few trees have been grown at Abu. It requires watering, during the hot season, for some years. The leaves and the oil expressed from them are used medicinally for colds, coughs, and other complaints.

Ghor bel (*Pueraria tuberosa*) is a species of wild vetch, common on Mount Abu and some of the other high peaks of the Aravallis; it shoots out after the May showers and produces a pea-like blossom in July. The young shoots and leaves are excellent food for horses; the oldest and most lean quickly gain in condition on it, and it is so abundant in albumen that they can work, when fed on it, in a way they could not do on any other green food with which I am acquainted.

Gonda (*Cordia Myxa*) is a middle-sized tree, with a berry-like fruit which is eaten, and used in clarifying sugar, after it has been dried; the leaves are used as a poultice in colic and other abdominal and chest affections.

Grapes, strawberries, and Cape gooseberries are grown on Mount Abu, and in a few other places in these States. The mushrooms of Mount Abu are of excellent quality, and sometimes very abundant after the first showers of the monsoon have penetrated into the soil and moistened it. They disappear again after the heavy rains have well set in. The Abu mushroom is the small species, which is easily distinguished from the poisonous cryptogamic fungi by its smell, light salmon-pink colour underneath, and the readiness with which the rind peels off.

Gular (*Ficus glomerata*), a common species of wild fig, is met with throughout these hills; its fruit attracts bears for the sportsman, and it is supposed to be the sycamore of the Bible.

Jal (*Hiptage madablota*), a twining shrub with bright leaves,

collected in great quantities after the first showers of May, for feeding milch cows, which do well on them.

Jaman (*Eugenia Jambolana*), a common tree with abundance of green foliage, met with in Abu near the lake, and in the damp ravines of the Aravallis. Its fruit makes fair jam, and it is eaten by the people. The wood is used for domestic purposes, and the shade is excellent in the hot weather.

Grevellia (*Grevellia robusta*) has been imported from Australia, and cultivated at Abu, and in a few other places in these States. It is a handsome tree, and grows well in the hills, if watered for a couple of years during the dry months.

Kachnár (*Bauhinia racemosa*), the geranium tree, when in bloom, is one of the prettiest trees in Abu, and it is also found in some of the other hills. It blossoms in great luxuriance, in March and April; both the flowers and pods are boiled and eaten by the people.

Kárá (*Strobilanthus callosus*), a shrub which covers Mount Abu with bloom once in seven or eight years, and which is found on some of the peaks of the Aravallis, but not in such profusion. This shrub has to accumulate much root-energy before it blooms; consequently it does not flower every year. A few flowers are seen the year before the great bloom takes place, and a few shrubs are left to blossom the year after; but most of them die down in the dry season after the great bloom. The people of the hill consider this occasional luxuriance in flowers on Mount Abu a special omen from the saint of the hill, to indicate a season of prosperity, and as the shrub requires an abundant rainfall to bring it out, it is only seen in flower in years of plenty.

Karundá (*Carissa carandas*) is a common green Abu bush, which produces a superior edible fruit at the beginning of the monsoon season: jam and jelly are sometimes made from this fruit, but they are not of first quality. The people are, how-

ever, very fond of Karundás, and they are exported to the plains below, in great quantities, for village consumption.

Khajur (*Phœnix sylvestris*), the wild date-palm, is common on Abu, and met with in some other places in the neighbourhood. The fruit is eaten by the people, although it is mostly skin and stone; the leaves are used to make mats and brooms, and the timber for roofing houses. The Persian date-palm has been imported and planted in these States, but it has not thriven well, on account of the dryness of the country. The Arabs say, "for the date to flourish, it must have its head in the sun and its feet in the water"; but the former condition only is possible in these States.

Kharaiyo or Kulu (*Sterculia urens*), one of the finest trees in the Aravallis and Lower Abu, when its large palmate leaves come out after the rains. A gum is obtained from it.

Kodala (*Sterculia villosa*), a fine tree of Abu and the Aravallis, from the bark fibre of which ropes are made.

Kowes (*Mucuna pruriens*), Cowich or Cusso, a creeper, from the pods of which the medicinal Cusso is obtained: a powerful anthelmintic and irritant of the skin, which will cause death if taken in an overdose.

Kuja or Jungli Gulab (*Rosa involucrata* and *R. moschata*). Two varieties of white dog-rose are found on Abu and some of the other hills adjacent; the fruit is used medicinally, and the flowers are beautiful and well scented.

Mál Kangni (*Celastrus paniculatus* and *C. stylosa*). Two varieties of this creeping shrub are met with in the hills. The young shoots and leaves are collected to feed cattle in Abu, when fodder is scarce; the seeds are taken as a tonic with sugar and ghee, and they are believed to make children thrive.

Maha nimbu (*Citrus decumana*), the pumalo tree, grows at Erinpura, in Sirohi State, and produces a well-flavoured fruit. Pumalo is believed to be tonic and anti-febric.

Mohwa (*Bassia latifolia*), a fine, handsome tree found in many parts of Marwar and Sirohi, the flowers of which are eaten by the people and much used in the distillation of country liquor. The flowers fall at night, and bears are very fond of them, so they may often be seen in the early morning picking them up; they also climb the trees to obtain them. The timber of this tree is valuable, as well as the flowers.

Narangi (*Citrus aurantium*), the orange tree, is cultivated in Marwar, Sirohi, and Jaisalmir, both for flowers and fruit, and in some places local oranges of excellent flavour are met with.

Nimbu (*Citrus acida*), the lime tree, is largely cultivated, and the fruit used as an antiscorbutic where vegetables are scarce.

Phaludra (*Erythrina lithosperma* and *E. arborescens*), the coral tree. It blossoms in great profusion in March before its leaves come out, when it is very pretty and striking. There are two varieties of this tree—one spiked, the other not.

Pipal (*Ficus religiosa*) is cultivated throughout the desert at Mahadeo's temples and holy places, and it is met with at every village in the fertile lands of Marwar and Sirohi. It is worshipped generally by Hindu women throughout these States, and where the soil is too arid for it to thrive Khejra is substituted. Barren females are particular devotees of this tree, and when it fails to bring them offspring they often try the worship of the Bar.

Ságwán (*Tectona grandis*), the teak tree, cultivated to a very limited extent. It does not stand the frosts of Mount Abu, but grows in the plains below. It is, however, often attacked by white ants.

Sálaran (*Boswellia serrata*) is a large, handsome tree, with pinnate leaves; it produces a scented gum, and is valuable as timber.

Sebla (*Bombax malabaricum*), the cotton tree, is met with

in Abu and the Aravallis; it is a tall, handsome tree, with large leaves, which come out after the flowers in March. An infusion of the bark is used as a tonic.

Setut (*Morus nigra*), the mulberry tree, is cultivated on Mount Abu, and produces abundant fruit; it also thrives in gardens in other parts of these States.

Shisham (*Dalbergia latifolia*) is cultivated at Jodhpore, and a few other places in these States; it grows well in the sands, but requires watering for a few years.

Sirgura (*Moringa concanensis*), the horse-radish, found in Abu and the Aravallis; leaves doubly pinnate, flowers yellow, blossoms late in the season.

Siris (*Albizzia lebbek*) is a common tree throughout the hills and fertile lands of Marwar and Sirohi. The outer wood is soft and of little value, while the inner wood is hard and black, and used for ornamental carving. An infusion of the bark is given to camels suffering from *Sirra* and other diseases. There are other varieties of Siris, wild and cultivated, in these States. Sitaphal (*Anona squamosa*), the custard apple tree, is cultivated in these States in some of the gardens, and the fruit is sometimes of good quality.

Tébron (*Diospyros tomentosum*), a fairly common tree of the hills which produces ebony.

Grasses of the Hills and Fertile Lands.

Baru (*Sorghum halepense*) is a grass which is met with all over the cultivated lands and plateaus. It is a strong, coarse grass, good for cattle and horses either as pasture or hay. The seed is made into bread during years of scarcity, and the coarser stems are used as pens,

Chhenki (*Paspalum kora*), a common coarse grass, good for pasture when young; it is found in the lowlands.

Dob (*Cynodon dactylon*), a fine grass, found in well-watered

lands; good for pasture and fodder, and keeps as hay for years.

Kusha or Dáb (*Eragrostis cynosursides* is found everywhere.

Khas (*Khas oderiferus*), a sweet-scented grass, found near tanks, the roots of which are used for making Khas "tattis," fans, and pankhas. Delicate scent is also made from it.

Karar (*Iseilema laxum*), a heavy, coarse grass, which grows on good soil, is used as pasture, fodder, and thatch for huts.

Lámp or Monj (*Aristida hystrix*), a hard grass, met with in many parts of the country. Cattle eat it when other grass is scarce, and it is used for ropes, cots, and matting.

Seran (*Ischœmum laxum*), called moya, is found in the hills and plateaus; it is hard, but animals eat it, and it is used for ropes like Lámp.

Surwálá (*Heteropogon contortus*) is found in both hills and plains. Though hard, horses and cattle eat it, both in the green and dry state.

Trees and Shrubs of the Desert.

The Ák or Ákra (*Calotropis procera*) is the flowering shrub of the desert; it is in bloom for many months of the year, and its leaves are always green in the hottest weather; nor is it without its uses for roofing dwellings, making cattle enclosures, and for firewood. The cotton-like substance which surrounds its seeds in their loculi is used for pillows and quilts, and the acrid juice of its green shoots is in common use as a medicine.

Arunja or Armajia (*Acacia leucophlœa*) and some other varieties of acacia are common throughout the hard desert. They are generally undergrown, but they sometimes produce timber for agricultural implements and firewood.

Ber, Borti, or Bor (*Zizyphus Jujuba*, *Z. nummularia*, and *Z. vulgaris*) are met with throughout these States; the first variety often cultivated as a fruit tree, the others wild, and

the most important fodder and fruit shrubs of the country. *Z. vulgaris* is cut close to the ground, when the fruit and leaves are in their prime, and allowed to dry in the sun, then thrashed with sticks, when the leaves and fruit fall off, and form the staple fodder, especially when grass is scarce. Camels work well on it as food; cattle, horses, goats, and sheep can subsist on it when there is no grass, as it flourishes in years of diminished rainfall, thus often saving the animals from starvation.

Bhu Bambli (*Acacia Jacquemonti*) produces a wood in the hard desert which is much prized by goldsmiths for beating out gold-leaf, on account of its hardness and smoothness. Kankera (*Gymnosporia montana*), found in a dwarf form in the sandstone hills, is used medicinally.

Hajeru (*Mimosa rubicaulis*) is found in the desert, where it augments the camel food. There are several other stunted varieties of mimoseæ in these States which serve the same purpose, and which hardly grow large enough to make firewood.

Hingota (*Balanites roxburghii*) and Khimp (*Orthanthera viminia*) are stunted shrubs of the desert, which help the camel to subsist in times of need.

The Imli or Tamarind tree (*Tamarindus indica*) is cultivated in the desert, in watered nooks, and found in abundance in the fertile lands of Marwar and Sirohi, adjacent to the Aravalli Range, where it grows to a very large size. The pods are much used in culinary, the seeds in medicine, and the timber for domestic purposes. It is grown in the gardens and adjacent to tanks in many parts of the desert.

Jhal and Chhoti Jhal (*Salvadora persica* and *S. oleoides*) flourish throughout the sandy desert and extend into the stony tracts, where they may be seen almost denuded of their usually fine foliage, struggling to survive. The wood of these trees is of inferior quality, and greatly used for burning. Camels feed

on the leaves and shoots, especially in the salt tracts, where they are abundant, and their fruit is eaten by the people.

Kankera (*Gymnosporia montana*) is met with in a stunted condition in the stony desert; its leaves are used medicinally, and its wood made into rosary beads.

Kair (*Capparis aphylla*), a very valuable tree in the desert, as it provides much food for camels and goats, and a timber which is greatly used in roofing houses and for agricultural purposes. The crimson flower of the Kair gives a brilliant appearance to parts of the sandy waste in March and April, but it is not otherwise handsome. The fruit is eaten by the people.

The Khejra (*Prosopis spicigera*) is the most important tree of the desert. It grows from seed in the natural way, without planting or watering, and its roots sink so deeply into the sand and fissures of the rocks, that it withstands season after season of unusual drought, and it can blossom and produce its peas under the most adverse conditions of climate and season, when other plants and trees seem to wither away or stand still in a stock-like condition, without any signs of life. The Khejra is nearly everything to the inhabitants of the desert. Its leaves and shoots provide them with vegetables. They eat its peas as fruit, and give its branches and leaves to their camels, goats, and cattle, when all other pasture is dried up and useless. Its shade protects them from the noonday sun. Its wood is used for roofing their houses and made into carts, saddles, and agricultural implements, and what is useless for other purposes is used as firewood. The fresh bark is, in years of famine, stripped off and ground up with grain, to give the meagre meal a substantial bulk, and thereby to ward off the pangs of hunger for a longer period. This tree is well worthy of being held sacred by the Bishnois and other desert tribes.

The Kumtia (*Acacia rupestris*) is a useful tree, and grows both in the sandy and stony deserts, without any protection.

It produces much gum, and makes the best heads for polo sticks, as the wood is light and tough.

Lana (*Haloxylon salicornicum*), found in Jaisalmir and in a few places on the Marwar border in that direction, is a small shrub with a greenish-white flower and a small round seed, which provides much food for camels in the hard desert, and on which some of the people can subsist during times of scarcity. They make bread from the seeds, almost equal to bajra bread, and the young shoots are also cooked and eaten as vegetables. This shrub has so much root energy, and penetrates so deeply into the sands, that it can bloom and seed even in years of the greatest drought.

The Nim (*Melia indica*) is the tree that repays cultivation best in these States. It is always green, and can be pruned to feed camels on occasions of necessity. Its shade is excellent, as the leaves come out afresh at the beginning of the hot weather. The fruit is eaten, and the timber is of fine quality. It, however, requires watering in the arid regions for a few years at first, and it cannot throw out thorns, as the Khejra does, for self-protection; consequently, it requires to be fenced in for a time, till it grows beyond the reach of goats and camels. The "Nim" grows well on the sands which are saturated with brackish water, and it is the most common village tree along the banks of the Luni River. It is also cultivated at many of the village wells throughout the desert.

Rohira (*Tecoma undulata*) grows well in many parts of both the sandy and stony deserts, and flowers in March and April, lighting up the sands with its variegated flowers, and adding greatly to the beauty of some of the villages. Its wood is used for domestic purposes.

Phog (*Colligonum polygonoides*) is the desert shrub on which camels have to subsist during the greater part of the year. Its seed and young shoots are eaten by the people in years of scarcity.

Thor (*Euphorbia royleana* and *E. nivulia*) are met with in many parts of the desert, where they are both wild and planted as fences. The juice of these shrubs is used in medicine by the people both as an internal and external remedy.

Grasses of the Desert.

Bhurat or Burat (*Cenchrus catharticus*) is the most important grass of the desert, as it has much root energy, sprouts early with very little rain, and its seed makes fair bread when ground. It is brought out by a few early showers which produce no crops, and it is often abundant in years of scarcity, when the poorer people subsist on it, and when it saves the herds and flocks from being driven away from the country in search of pasture. The seed of this grass is enclosed in a barbed capsule which is difficult to remove, and which adheres to the skin and clothes, producing great irritation. So difficult is the capsule to remove from the seed that a hard-working man can only produce sufficient bread for four souls from this grass in a day, even when it is very plentiful; however, the whole family turn out to work at it, and in this way save themselves from starvation. Horses accustomed to the grass thrive well on it, but animals unaccustomed to it have great difficulty in masticating the barbed spines, and Waler horses will often starve rather than eat it.

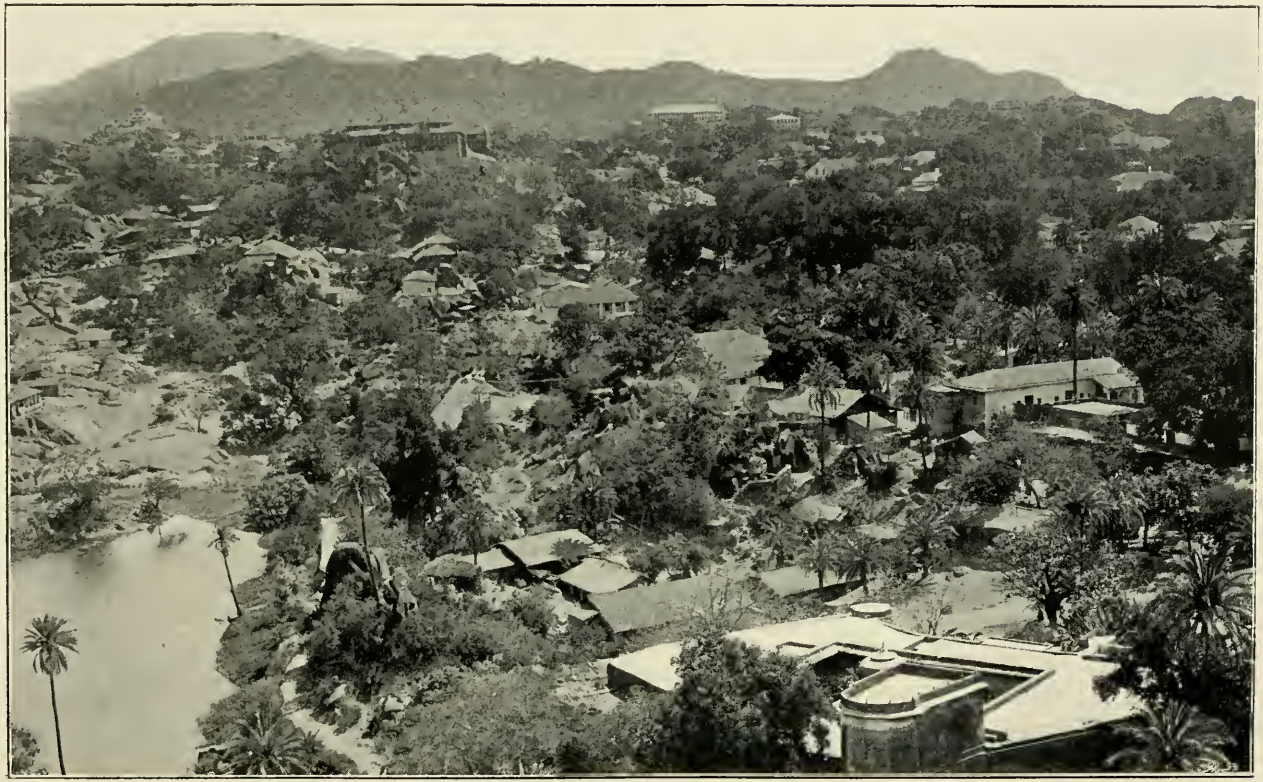
Murath or Makra (*Chloris roxburghiana*) is the next in importance to bhurat of the desert grasses. It is good for fodder and pasture, and its seed is collected and eaten by the people in years of scarcity.

Mothea (*Mothea tuberosa*) is a grass with an edible root, which provides much food for the people.

Tantia or Sawan grass (*Eleusina flagellifera*) is general throughout the desert, and its seed is sometimes collected to supplement the food of man. It is a grass which is common

throughout the desert, but is not relished by horses or cattle, so it is left over till other grasses have become scarce. It affords good cover for quail.

Dhaman (*Pennisetum conchroides*) is abundant in the sandy desert and fertile plateaus. It is considered the best food for milch cows, and horses also thrive on it.



Mount Abu, with Lake and Barracks, Residency and other houses. *To face page* 423.

FERNS AND FLOWERS

Twenty-nine different varieties of ferns have been found on Mount Abu by Watling. However, on account of the long dry season which follows the rains, and the winter frosts, most of them die down annually, and only begin to sprout again when the monsoon is approaching. A complete collection can only be made during the damp season, when they flourish luxuriantly. The following are some of the best known ferns of the Aravallis and Mount Abu:—*Blechnum orientale, Davallia pulchra, Pteris quadriaurita, Asplenium trapeziforme, Phymatodes lepidotum, Adiantum caudatum, Actiniopteris dichotoma, Cheilanthes tenuifolia, Cheilanthes farinosa, Cheilanthes aravallensis, Cyathea spinulosa, Athyrium fimbriatum, Adiantum hispidulum, Asplenium varians, Nephrodium molle,* and a variety of *Polypodium quercifolium.*

The dryness of the climate and the distance of water from the surface render horticulture backward, as a necessity, in most parts of these States. A few hardy perennial creepers, flowering shrubs, some pots and beds of annuals, make up the flower-gardens, except in Mount Abu, where a good show of cultivated flowers is not difficult to produce at any season. Wild flowers are also abundant in the hills here, especially during the monsoon season, and many of the trees blossom luxuriantly. Violets, pansies, geraniums, dahlias, and sweet pea; asters, balsams, marigolds, and nasturtiums; mignonette, zinnias, dianthus, helianthus, periwinkles, flox and stock; heliotrope, lilies, irides, roses, fuschias, and hibiscus of varied hues, bloom profusely in the Abu gardens, without much

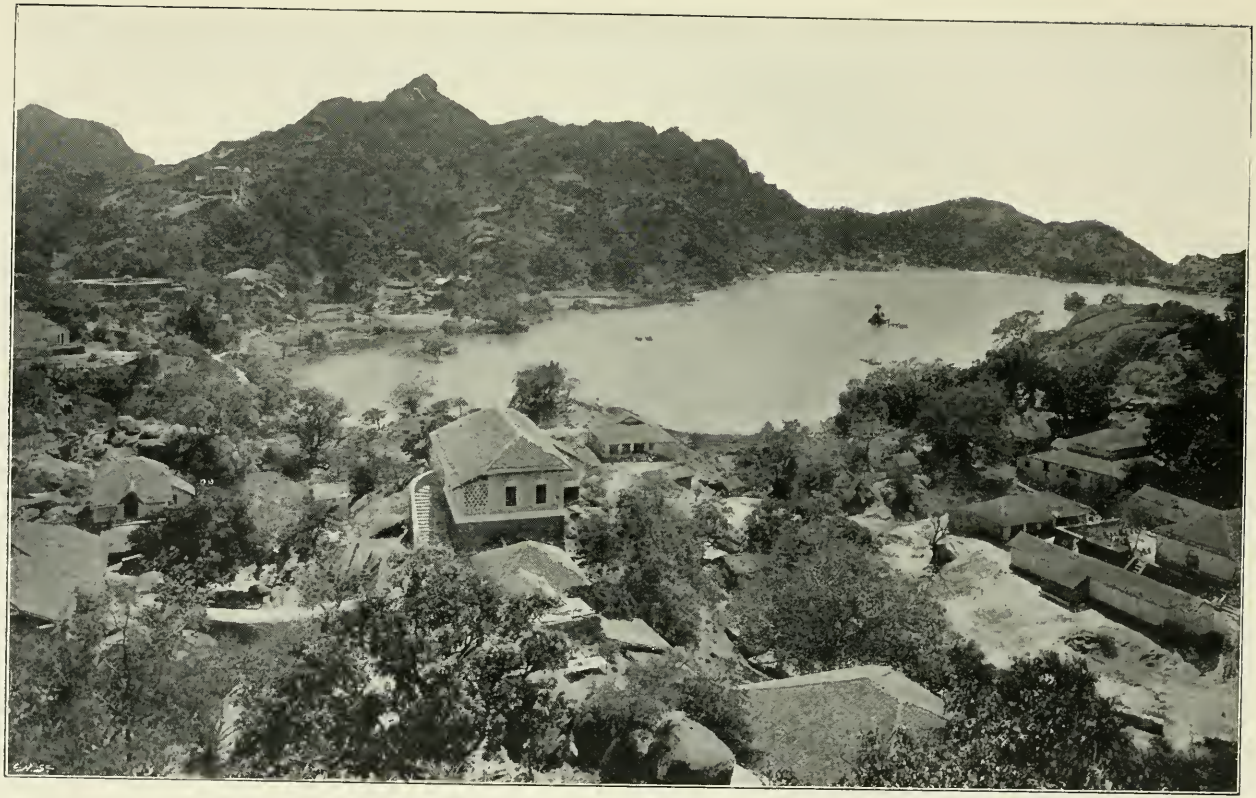
trouble to the gardener. There is hardly a flowering plant or shrub, except the most delicate, that will not grow here with proper care, and a little protection during the short periods of summer heat and winter frost. Most of the flowering creepers flourish on Mount Abu, and many of them thrive in the gardens below, when they are watered and cared for. The following creepers are common on Abu, viz., *Passiflora cœmlia*, passion flower, three varieties, mauve, red, and yellow; *Gelsemium*, yellow jasmine; *Bignonia venusta; Hiptage madablota; Bougainvillea spectatilis; Banisteria laurifolia; Runborgia grandiflora; Antigonum leptopus; Sandwich Island creeper; Tecoma jasminoides; Ipomea purpura*, common purple creeper; *Wistaria linensis*, found wild, and two varieties of honeysuckle; *Lonicera periclymenum*, English woodbine, and *Lonicera sempervirens*, American woodbine.

Datura stramonium, a well-known Solanaceæ, grows wild on Abu and the Aravallis, and is cultivated below for its flowers, as well as its seeds and leaves, which are used medicinally in asthmatic and other spasmodic affections. The seeds of this plant are also used criminally as a poison for both man and animals, and the seeds and leaves are smoked with tobacco.

Caladiums and Crotons can be cultivated at Abu; but the long dry season is severe on them, and they require protection during the frost.

Poinsettia, bright Acalypha, and other shrubs with brilliant foliage, grow well in Abu, and, with a little skill and labour, a combination of the beauties both of the greenhouse and the garden can soon be obtained out of doors on this hill.

Garden-flowers grow wild on Abu, and wild flowers spring up everywhere in the rains. Some are very lovely, and there is much variety of shape and display of colours among them. The Abu orchid is very abundant and beautiful when it blossoms on the mango and other trees in the monsoon season. There is another orchid with a larger flower, of a pale blue and



Lake and Dispensary, Mount Abu.

To face page 424.

white colour, met with in the Lower Aravallis, towards Kotra. Three varieties of orchis, or ground orchid, are found on Abu, and also many varieties of flowering scrofula, boraginous and labiate plants, most of which bloom in the damp season. There are two varieties of wild dog-rose indigenous in this hill, and roses grow in great profusion wherever cuttings are put in, making excellent hedges and magnificent clumps, which become covered with bloom in early spring, and again in autumn. There are two varieties of oleander and two of jasmine (both wild on the hill) which have escaped from gardens or been carried up by pilgrims, like the mangoes, now wild. The geranium, dhak, dudeli, kerna, cassia, corral, and cotton trees blossom with great profusion, and the strobilanthus covers the hill with one blaze of bloom once in seven or eight years, after the monsoon. There are many other trees which add materially to the great natural beauty of Abu and the Aravallis by their beautiful flowers and foliage.

VEGETABLES

The kitchen-gardener is beset with the same difficulties here which have been mentioned in connection with floriculture, viz., the dryness of the soil and light rainfall. At Abu, Sirohi, Erinpura, and Jodhpore, English vegetables are obtainable during the cold months in abundance, and a very limited supply can be procured at other seasons of the year. Potatoes are grown for the market during the rains on Mount Abu, and during the cold weather in a few other places. They are generally of fair quality, although not equal to the Himalayan tuber. Lettuces, turnips, carrots, cauliflowers, parsnips, cabbages, tomatoes, cucumbers, celery, spinage, two species of artichoke, peas and beans of several sorts, can be cultivated throughout the cold weather wherever there is fresh water, as the soil is generally suitable, and the climate of the plains sufficiently cool between October and April. Fresh vegetables might be obtained throughout the year under skilled gardening in the hills. Many of the country vegetables are useful in the kitchen, as they flourish in the plains when English plants wither away on account of the heat. Leeks, onions, and two varieties of radish are in common use, and they grow even when the water is brackish. Brinjols, bintaks or bengans, bhindis, vegetable marrow, sweet potatoes, yams, pumpkins, karélas, kunkoras, ramas, methi, chundlia, palka, and tindsi are the principal vegetables of the people, and they are all wholesome and fairly palatable. Excellent mushrooms are found on Mount Abu and some of the other hills.

FRUIT

The fruit-trees have been already given under their vernacular and botanical names. Much of the fruit used is imported. Melons, mangoes, plantains, oranges, limes, pumaloes, and leechies are cultivated, and also imported into the capitals and many of the large towns. Pomegranates are grown in gardens in the plains wherever water can be obtained, and this fruit is highly prized throughout these States. Plums (*Zizyphus Jujuba*) are the most common fruit in the bazaars. Grapes and peaches grow on Mount Abu, and ripen in time if the vines and trees be properly attended to and manured. Strawberries can be grown on Abu, and some varieties of vine do well at Sirohi, Erinpura, and other places in the plains. The wild mango and karunda of Abu are in general use, and are sent to all villages near the hill. Water-melons are cultivated throughout the desert. They grow to an enormous size in many places, and are of very fine flavour; one is often sufficient to refresh both the desert traveller and his horse.

Many of the people of the desert have to substitute wild leaves and pods for vegetables, and the plum of the common "bor" bush is their principal fruit. The fruit of the wild caper and of the "nim" are also eaten.

A proper supply of vegetables or fruit is essential to health, and when both can be obtained they should be taken advantage of, to keep the blood in a pure state and lessen the liability to disease. The want of fresh vegetables and fruit in the daily meals leads to degeneration of the blood and tissues, and stunted growth in children. Besides, indigestion, scurvy, liver, and

bowel diseases are often brought on by a diet meagre in these essential constituents. Prisoners suffer much from insufficient fresh vegetables, and I have often seen sepoys in regiments in impaired health from neglect of this necessary ingredient of their rations. Many of the people in the desert suffer from scurvy in bad years, when they have to subsist on old grain, with little milk, and few of the fresh leaves which spring up in seasons of abundant rain, to supply the want of fresh vegetables.

Kitchen-gardening should receive every possible encouragement, both as a useful art and a pleasant pastime, which admits of fresh air and exercise being taken, while energy is being turned to profitable account, and the brain of the head-worker rested.

Maharawal, Sardars and Attendants, Jaisalmir.

To face page 429.

THE VILLAGE AND VILLAGER

The village here is anything—other than the capital of the State: it is the literal translation of the word *gaon* which is applied to rural centres of considerable population. Many of these villages would be called towns in most places and cities in America. Villages are not laid out here in squares and straight lines of houses with wide streets between. They are generally clusters of houses with a big fence of *bor* thorns around them, from which the leaves have been thrashed for camel fodder. The streets are mostly narrow and crooked, ending in a central square with shops, which is the bazaar, or in the courtyard of some house. There is usually a main street passing through the village; but if the traveller deviate from this, he may have difficulty in extricating himself from the network of narrow passages which make up the secondary streets of the village. The best houses are in the centre of the village, or on an elevation at the top of the town. The inferior houses form the outer circle, or they are lower down, and tail off in a straggling formation. The superior houses are solidly built of stone and lime, or bricks, and with stone or tiled roofs. The smaller houses, or huts, are of mud, or mud-plaster on wicker-work, with thatched roofs, often shaped like bee-hives. All houses have enclosures for domestic animals; these are walled in with arched doorways at all the great houses, and merely fences of thorns in front of the inferior dwellings.

Every village has its menial quarter for aboriginal Bhils sweepers, and others not entitled to reside within the great enclosure, and these outcasts protect themselves by a secondary

fence. Besides house enclosures, there are strongly fenced pens for camels, cattle, sheep and goats not wanted at the houses.

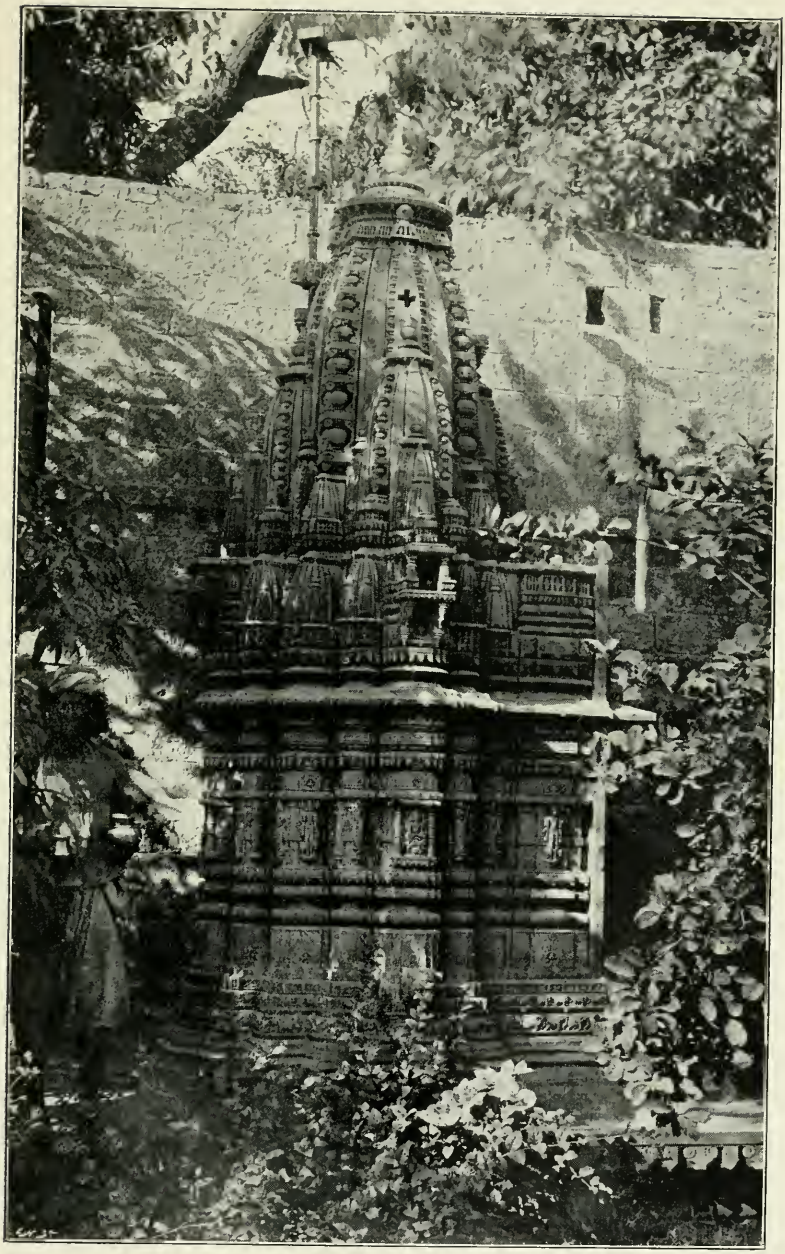
The little village has merely a few central houses for Rajputs, Banias, and Brahmins, and a number of huts around them, with the usual thorn fence outside.

The big village is a walled city, with arched gateways, loop-holes, battlements, and turrets for defence. The gates are strong and spiked to prevent battering with elephants. A broad street, with fine houses on either side, and intersected by numerous secondary streets, leads up to the owner's residence, which is strongly fortified, and is in many instances a veritable castle. The modest Baron talks of this as "My Village" or "My Gaon," in contradistinction to the city or *shahr*, the capital of his chief. There are mounted guns here, but the sentry sits, instead of pacing up and down his beat in the usual military fashion. He is nevertheless watchful, and the gates are regularly barred at night against invaders.

Without the walls, as at the ordinary village, there are huts for sweepers and other low castes, and the usual enclosures for stock.

The temple, too, is often located in a grove of trees beyond village limits; but there are other temples within all great villages, for the convenience of the pious and the protection of the place. Here the bells ring morning and evening, and worship is regularly attended to by the Brahmins in charge. Women can be seen carrying up the offerings of their houses set apart for the temple and the priests thereof. The villagers are a religious people, and they give freely to their temples and the Brahmins.

Villages are of many sorts and sizes, and in some instances they are merely the head-quarters of numerous hamlets, in which case most of the agricultural population reside on their fields, in huts called *dhanis*, where they keep their cattle and belongings for convenience of pasture, and to be near



Temple.

To face page 430.

their work. The land-owner, dealers, artisans, and others reside in the village, and the whole colony acknowledge themselves of it, under one village name. These colonies are common in the less fertile tracts of Marwar.

The Thakar-Sahib, or landlord, or Rajput, occupies the principal house at the top of the village, which generally overlooks all the other dwellings, and is fortified. Big houses have more than one enclosure for horses, milk cows, fighting rams, an elephant or two, and dogs for the chase. The Rajput loves his horse, and treats him as one of the family. So the basements of big houses and even palaces are built for stables. The horses are within the enclosures, all around their master, and often, even in the innermost circle, set apart for the ladies of the Zenana. When the Rajput's wife questioned her husband's wisdom in feeding his horses on clarified butter (ghee), and pointed out that the antelope, subsisting on green food, could far surpass them in speed and endurance, he replied, "Grudge not the ghee; the horses will be useful in the battlefield where swords clash."

Banias, Brahmins, and other villagers are also attached to their animals, and keep their horses and cows in the front enclosures or even in the verandas of their houses. Nor does the camel-man outcaste his animals; so the camel is allowed to rest close to where his master sleeps. The Rabaris, or herdsmen and shepherds, cannot take their large herds and flocks into their houses; so they make their beds in the enclosures, and sleep there to be near their stock, where they are fed by their wives and children.

Every village has at least one well or tank, where brightly dressed women can be seen, morning and evening, streaming to and fro, with metal and earthen water-vessels on their heads, and where hundreds of cattle, camels, sheep, and goats await an opportunity to drink.

Where the water-supply is good, the village is generally

large and populous. But hills and positions of strategical advantage have, in early and troublous times, determined the sites of some of the fine fortified towns here, whereas, during later years of peace and prosperity, a fertile soil has been the making of many of the most flourishing agricultural villages.

Rich villages improve their tanks and wells, store up a grain and fodder reserve against famine, protect and plant trees, set apart lands for hay and grazing during the hot months, and even do a little to improve sanitation. Such villages have much esprit and common interest; whereas poor villages are wholly occupied in providing for immediate wants, and they are often found deserted in bad years, the population being semi-nomadic.

The village has changed little during centuries, and the villager has hardly moved out of his old groove, although he has greatly benefited by long years of peace. Indeed, as the Irishman in the bog said of himself, so the villager is no upstart; he is where his father left him. Even now, with the Mayo College and other educational advantages for the upper classes, there will not be a rapid change in village life, as the customs are congenial to the people, and suitable to their surroundings.

The Thakar, or head of the village, is esteemed by all, regardless of his short-comings, if he live up to the traditions of his ancestors, borrow money, pay interest, keep up state, live and let live. He is "to the manor born," and he has all the privileges of a feudal lord. He can sit down with his retainers on occasions, without detriment to his position. He can be severe and exacting, and it is not resented, if only occasional. He is the privileged of all the village: his skill is extolled when he rides, fences, and shoots well, and the first place in the chase, as in everything else, is reserved for him without competition. His failings are excused; he is

The Nautch Musicians and Dancing-girls, Jaisalmir. *To face page* 432.

flattered, petted, and enticed to the bottle and the *nauch*. The village would be very dull without these, its old institutions of dissipation; and it is not the fault of the Mayo College if some of the gilded youth of this part of the country, to whom a thorough training has been given in that excellent institution, have returned to their ancestral halls, and pursued pleasure after the manner of their fathers, rather than turned out exemplary squires. Employment is wanted, and the village would not approve of the Thakar taking over the control of his estate, and working like an office drudge: "he can pay a man for drudgery of that sort." There are now no boundary feuds with his neighbours, no intertribal wars, and, under the *Pax Britannica*, his chief's calls on him and his retainers for service have, of necessity, become few. So time drags heavily on the unoccupied of the village.

The Thakar appears to advantage when he heads the procession on the occasion of a grand festival like the Dassera. Mounted on his prancing and caparisoned steed, with "the curved mane and a flowing tail" common to well-bred Marwari horses, and closely followed by all his mounted retainers and the entire village, he leads forth, admired by all. His saddle is a work of art in variegated silk and embroidery, bespangled with gold and jewels. His sword is his father's, golden-hilted, velvet-cased, and "girded on" with a tinted samber-leather belt and ornamental buckle. On his turban and neck are displayed many heirlooms in gold and diamonds. The bright *puggaris* of the village men, mounted on adorned horses and camels, and the brilliant dresses of the women and children seated in country carts drawn by ornamented bullocks, make a magnificent spectacle. Charans or poets chant and women sing the praises of the Thakar and his ancestors. There are horns, pipes, cymbals, drums, and other instruments of music to add to the grandeur of the occasion; and the whole pageant pleases the people, who, at the conclusion of the ceremonies,

return to their own houses well satisfied with their ancient customs and the chief of their village.

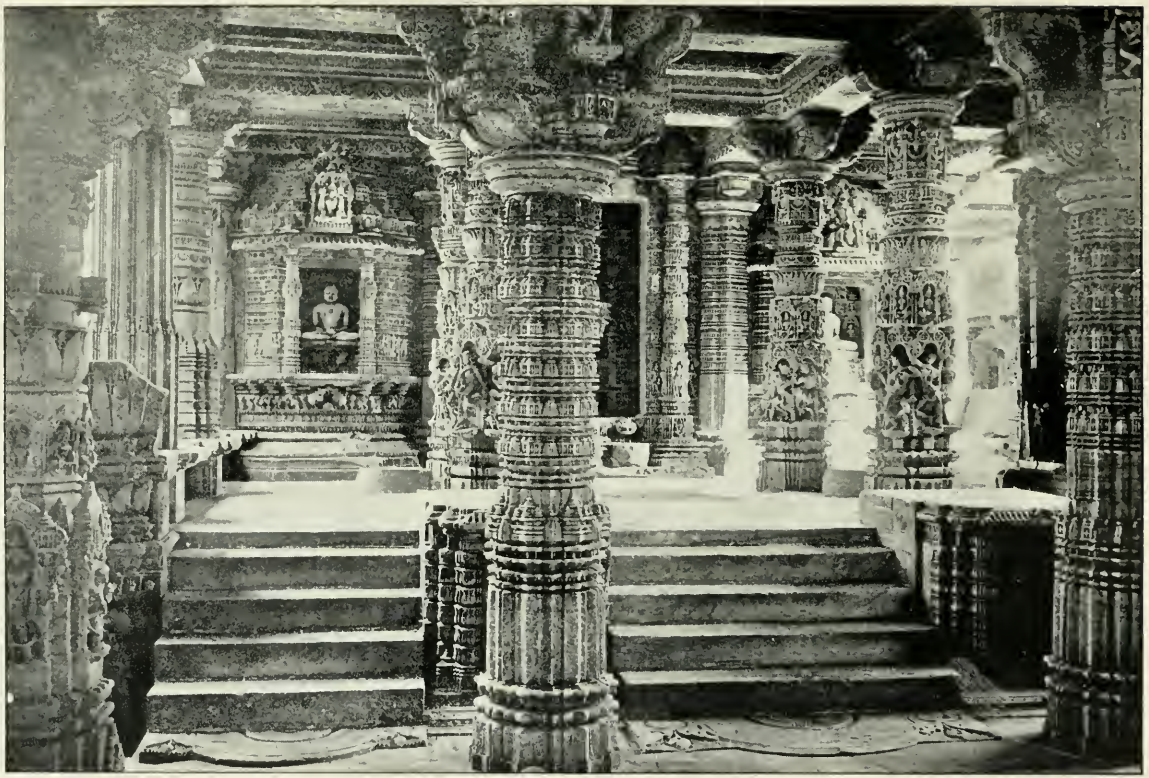
The Thakar is generous and hospitable. When at home he distributes opium to all callers, and wine to his Rajput friends and others able to appreciate the beverage. He is not fond of going abroad; he lives with his retainers and people, who thoroughly appreciate him, and he does not enjoy mixing with the outside world, where he loses in status, and receives less attention than he is accustomed to. He is essentially polite on all occasions, and punctilious in ceremony: he will return calls in the most formal manner, attended by the largest possible retinue, as he delights in formality and following, and carries himself through functions with great dignity and composure.

The Kamdar, or agent, is the principal official, and generally a Bania, who turns his tenure of office to profitable account and makes money. His harvest-time is during a minority, with the head dowager-lady of the family nominally in authority.

Before the Thakar can speak, his female relations and domestics begin to negotiate for his marriage, and his principal wife must, if possible, be from a house greater or equal to his own. This is an important point in the eyes of the village, and to accomplish it is the only circumstance that could be allowed to stand in the way of an early marriage. No respectable man's son could be allowed to remain a bachelor beyond ten or fifteen years of age; the village would not tolerate it, and they despise the bachelor.

The villagers expect their Thakar to have many wives, and he can bestow favour on other Rajputs by marrying some of their daughters when they are in excess of requirements, and cannot be disposed of to others with advantage to their families. "I put favour on him," said the great man; "I married his female relations, and he should be deeply grateful to me for that concession."

Rajputs do not see much of their mothers-in-law, nor indeed



Jain Temple, Mount Abu.

To face page 434.

of their fathers-in-law. It is not the custom for the son-in-law to visit much with his fathers-in-law, especially when they are of lower rank than himself. "I know him very well," said the Rajput; "I married a couple of his daughters, and went to his village for the ceremony when I was a boy, but I forget his name just now. He had a lot of girls, poor man! but he is of very good family, and they had to be married off for him."

The daughters and female relations of all well-regulated houses must be married early regardless of expense. An elderly spinster would be a positive disgrace to the village, and a maiden aunt would be too anomalous, and could only be accounted for by a curse on the house, or by some domestic skeleton of a grave and lasting character.

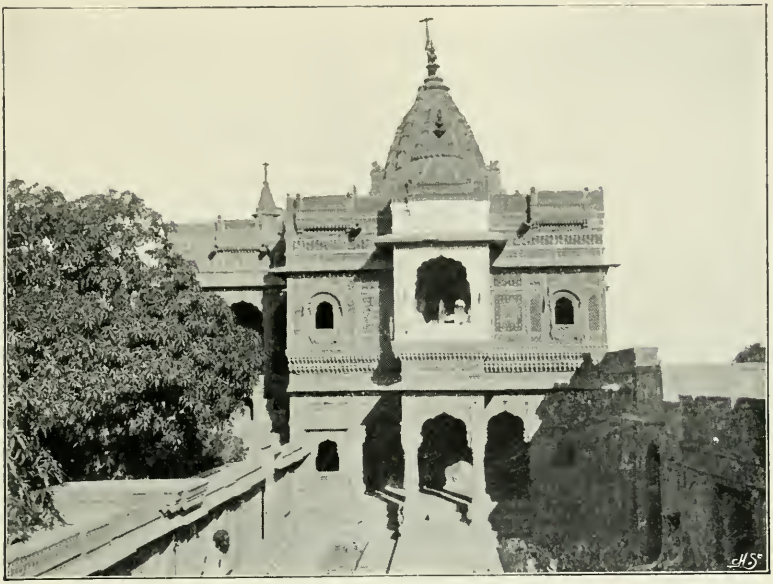
The birth of a daughter is considered a family calamity, which has to be passed over in silence and borne with fortitude. "Don't be down-hearted," said the State Council to their friend, whom they met to condole with on the birth of a daughter; "such misfortunes are in the hands of Providence, and man is helpless against them." The "father of a daughter" (Beti-ka-Bap) is a contemptuous epithet, and such a person is the despised of the village if he be poor, and the pitied if he be a great man. "Why do you call him the father of a daughter?" said the great man. "Because he is a Beti-ka-Bap, and good for nothing too." "I also am only the father of daughters." "But your honour is great. You must be excused. The misfortune can't be helped. You can do as you please."

In such a state of society, it will readily be understood that the unfortunate official whose duty it is to register births has a difficult task before him, and it is not strange that vital statistics are still far from accurate here. Indeed, the Thakar and the whole village resent such prying into their domestic occurrences, and they cannot understand the idle curiosity of a Government which expects them to report female births,

that only bring the derision of passers-by on themselves and their village. There is no difficulty about a son. All the villagers appear much elated on the occasion of a male birth, except the father, who, although highly pleased, does not think it manly to show his delight, as it would be "like boasting in mortal things." "Let me see the baby," said the Rajput trooper to a European lady's "ayah." "Ah! what a pity it wasn't a boy. We would all have had great rejoicings, and a grand treat too."

All pure-bred Rajputs are privileged in the village. They are kinsmen, and called brothers of the Thakar-Sahib, and have traditions, no matter what their means or occupation. They are expected to marry into clans equal to their own; the escutcheon of the noble race must not be stained with inferior blood. Half-castes are despised and drop below in the village.

From a fiscal point of view, the Banias, or dealers, are the most important class, and there are many of them in every large village, where they control the money market, export, import, and bank. They have a monopoly of trade and usury, possess much of the wealth of the country, and hold many of their fellow-villagers almost as bondsmen, on account of advances made in cash or seeds. The Bania possesses the business capacity of the hard-headed Scotchman, and he is as unrelenting and greedy as a Jew in all business transactions. The local sayings regarding him are, that "he resorts to sleight of hand when using his scales, to give light weight"; "his debts are deceptive as a scarecrow," and "his cunning in capturing his victim equal to that of the deer-trapper." "He overvalues and exaggerates the weight of what he gives, and he undervalues and under-estimates the weight of what he receives, to the extent of 25 per cent. of the whole." "Thus he carries on cheating, aided by his parsimonious wife; and is no less a robber than the Baori, the notorious village thief."



Garden, House, and Temple, Jaisalmir.

Dewan's Carriage, Jaisalmir. *To face page* 436.

The Bania is not infrequently hardly dealt with in return, and I have had to restore his nose, which had been cut off by his debtor, when he demanded his own with interest. Moreover, notwithstanding his austerities in matters of business, even with his fellow-villagers, he is a most useful member of the community, and has many good qualities which should not be forgotten. He is the most enterprising of India's sons, and the mainstay of trade and commerce in the East.

He quits his home in the desert at an early age, often penniless, but determined to make money, and he generally succeeds. He is steady in his habits, diligent, prudent, and reliable in business transactions with other business men. Consequently he is trusted, and has a good status in commercial circles. Although he will, at times, speculate to the extent of gambling in his haste to become rich, his caution is generally sufficient to avert ruin; and even when he loses heavily, he mostly manages to rally again, his thrift and tenacity of purpose are such marked features in his character.

When the Bania has made his fortune and revisits his village, he is known as the *Sethji*, and he then begins to work for a good name. He often keeps up considerable state, feeds Brahmins largely, gives to the poor, feeds the village dogs, builds a temple, sinks a well, and establishes drinking stations for thirsty travellers and rests for weary carriers on the highroads. He also spends much on wedding and funeral feasts, and becomes more lenient with his debtors in the village.

The security offered to the money-lender is not infrequently risky. However, the Bania advances both money and seed to his fellow-villagers in bad years, when they could not obtain succour from outside, thereby often saving them from starvation; and although he expects ample returns for his investments, he does not always get them. He is undoubtedly a benefactor to the careless villager, who takes little thought

for the future, and makes little or no provision against bad seasons.

The Marwari Bania mostly keeps up his home in the desert, and he does much for the country. He returns to marry, adopt, and recruit his health, shattered by town life. Most of his visits are marked by some act of liberality. Much of the money made in trade throughout India by these thrifty people is sent into the desert, and thus this arid part of India is made to flourish by their enterprise and energy.

When the young Bania marries, he often goes out into the world in quest of a fortune, leaving his bride behind till he can arrange to take her with him. This class has kept free from the pardah system of the Mahomedans, and on that account they have been relieved of the encumbrance of polygamy, which has so tied down the Rajputs. The men generally remarry only after the first wife's death, and widow-remarriage is strictly forbidden.

Banias' wives carry the water required in the house, attend to all domestic duties, and assist their husbands in their business. Their children are educated up to a certain standard, and they show a wonderful aptitude for figures and accounts as soon as they can articulate, talent for business being hereditary with them.

The whole village has interest in the crops and stock, and any one may cultivate, from the high Rajput to the outcaste aboriginal. Jats, Sirvis, Gujars, and Bishnois are, however, the best cultivators, and they devote themselves to agriculture. They give from a fifth to a half of the produce to their Thakar for the use of the land, and pay him other dues besides. They are honest, hard-working Hindus of good physique, who can live happily on little, so long as they are not worried by thieves or famines. Their wives and children take their food to the fields and assist them with their work. The cultivator asks but "a hut that does not leak, a good *munj* cot, plenty of *bajra* bread,"

Jaisalmir Country.

To face page 438.

milk, and curd. His wife's wants are also few, viz., "to be married in her father's village," "have her husband's field in the west," so that the sun may be on her back while going in the morning and returning in the evening, in order to save her complexion; and "the village tank convenient," so that she may not have to go far with the bullocks from the plough, to give them a drink.

There are artisans in all villages of importance, viz.: khatis or carpenters, and lohars or blacksmiths, to make and mend the carts and ploughs; mochis and chamars (shoemakers and tanners), kumars or potters, to make earthen vessels for domestic purposes and buckets for the Persian wheels which lift the water from the deep wells; darzis or tailors are met with, but they are not much patronised by the ordinary people, who make their own clothes during their leisure when the harvest is saved. Rangrez or dyers are always in request for weddings, fairs, and festivals, when bright dresses are worn by the women, and coloured puggaris by the men. Weaving is done in most villages by the lower castes of Hindus, generally Bhambis, and the spinning is done by almost all classes of women. Malis or gardeners grow leeks and onions, and, where water is abundant, other vegetables for the village market; but they generally stick to the large centres. Vegetable gardens are much neglected in most villages, to the detriment of health, and on this account land scurvy is not an infrequent disease. Sonars or goldsmiths are not wanting, except in small places, as the people are fond of ornaments, both real and imitation. There are rabaris and gawalas or herdsmen in all villages, and they take charge of the village herds and flocks, as a joint business, for which they receive a small remuneration from each house.

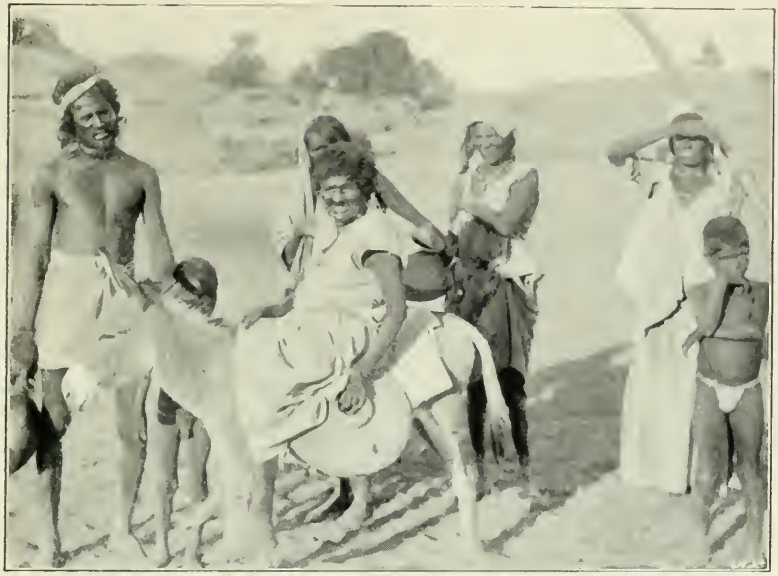
Servants are mostly half-caste and hereditary; but retainers are generally of pure birth. Servants exercise much authority in the domestic circle, and are more like helps than menials. The male domestic loves intrigue, ease, and plenty, with liquor and

tobacco thrown in, and he could beg as much work as would satisfy him if his other wants were well supplied. The saying is that "the female attendant in her bloom expects admiration, and occasionally wine, but always absolute authority in the kitchen." She becomes satisfied with tobacco and snuff, and is more given to work as she advances in years and fades in appearance.

Dhobis (washermen) and Bhishtis (water-carriers) are only found in the great houses. The ordinary people do their own washing and water-drawing.

The menial or coolie classes of the village are mostly Nais or barbers, Bhambis, aboriginal Bhils, and sweepers. There are Grasias, Minas, and Bhils in considerable numbers in many of the villages near the Aravallis, and a few in other parts. Most of them now cultivate, but they would prefer to work at dacoity and rob Banias' wives *en route* to weddings with their best jewellery on. Kolis, Dheds, Bhambis, Chamars, Sansis, Baoris, Bagris, and sweepers are found about most important villages. They are considered menials, and reside outside the village enclosure.

There are about seven per cent. of Mahomedans in Marwar villages, and a few of them own land. Many of them work in iron and cultivate. A considerable number are Sepoys and domestic servants. There are very few Mahomedans in Sirohi (only about three per cent. of the population), and they are mostly Bohras (Mahomedan dealers) and Sepoys. In Jaisalmir about one-fourth of the entire population is Mahomedan. They are cultivators and Sepoys. The butchers in all states are Mahomedans. Coolies who manufacture salt are called "Kharwals," and there are many of them settled in the salt tracts. Dholis are the professional musicians of these estates and they are beggars as well. They are residents of large villages; but they wander about, and are employed for weddings and other ceremonies. Some Mahomedans also adopt



Nomadic Aborigines.

To face page 440.

the profession of music, and perform on important occasions in the village, for money payments.

The Brahmin is, by right, the head of the church, and the highest caste among the people. His proper charge is the temple and the idols, and his occupation begging. But he has multiplied to such an extent that his sons take office as officials, serve in the ranks of the army, in the office and shop, and they even cultivate and tend cattle in the village. They also trade, and often show business capacity and power of amassing wealth hardly second to the Marwari Bania. Thousands of Brahmins in these estates live by begging, and save money from the proceeds, with which they ornament their wives and daughters, and even become usurers. It is said that some Brahmins will beg at the house where they have put out money at interest, and "shame is not put on them." The Srimalis are the greatest beggars, and it does not demean them in the eyes of their neighbours to beg when they possess considerable wealth, or even when their wives and daughters have much jewellery and fine clothes. Many of the Pushkarna Brahmins here are officials, and they now live less by begging than by other employment.

Brahmins are all privileged. They could not be hanged for murder till quite recently, and I have only known one instance in which execution was actually carried out. They are fed by the great on all big occasions, such as marriages, male births, and funeral feasts; and some of them eat inordinately at such times. However, if they die from excess, honour is done to the host. To feed Brahmins is the duty of all pious Hindus, and it atones for many sins. When a Hindu crosses the sea, he becomes temporarily an out-caste thereby; but he can be restored to his brethren by liberally feeding Brahmins. To injure a Brahmin entails more than ordinary punishment, and his curse is dreaded, even by noble houses. It may blight the marriage prospects of the ladies of the family, or bring disease upon the people.

The birth of the first-born son is an occasion which demands the feeding of many Brahmins, and they take presents away when the proud parent is in a position to provide them. It is therefore natural that they should think poorly of "fathers of daughters," as the birth of a daughter admits of no feastings, and she is of no use in this way until her marriage.

Brahmins are often fairly educated, even in remote villages. They sometimes study and apply astronomy and medicine, and they indulge in evil prophecy against those who depart from their dictates. They attribute failure of rain, famine, and pestilence, and even local calamities to the evildoings of the people, and the neglect of the proper observances laid down by the church.

When in charge of temples, they officiate at marriages, attend funerals, select names for the children, act as astrologers and medical men, give forecasts of the seasons and times, and they get grants from the village for such offices.

They are husbands of one wife, and they provide for their poor relations if these cannot be otherwise fed and clothed; but they do not give charity to other castes.

Charans or poets, who make odes and songs for the village magnate, live greatly on charity, free grants of land, and dues. They attend weddings and funeral feasts, and indulge in lampoons when dissatisfied with their treatment. They, like the Brahmins, have also to be appeased by feasts and gifts, and they add to the many taxes on the landed aristocracy of the country.

Education is still far behind in the village. Some of the Rajput boys get a rudimentary education from a Brahmin tutor at their own homes. Others are sent to school at the capital, where they read up to a higher standard, and a few of the wealthy families give their sons the advantage of a Mayo College training. From the Mayo College they are generally turned out with a good knowledge of English, and they are always proficient in outdoor games. The village Rajput boy

Monuments of Border Fight between Villagers.

Monuments or Chattris. *To face page* 442.

is invariably very much smartened and improved by residence in that well-ordered institution, and he acquires regular habits, which should be of advantage to him during his whole lifetime.

There is mostly a village school for Brahmins and Banias, where Hindi, arithmetic, and writing are taught, and these castes take some pains about the education of their boys.

Some of the Mahomedans have their sons taught Urdu and Persian to enable them to read the Koran; however, many of them are careless in regard to education.

The other classes in the village generally show a great want of appreciation of education, unless in occasional instances, and female education is greatly neglected everywhere.

The learned professions are not well represented in the village. Any one supposing himself to be in possession of an occult remedy practises medicine, and the temple Brahmin generally combines the treatment of disease by charms or incantations with his divine calling. There are bleeders, rubbers, herbalists, and sometimes an hereditary hakim or baid in most of the large villages. The barber, blacksmith, carpenter, or other handy man can set fractures after a fashion; but the treatment is often fatal to the limb. There are now fortunately dispensaries at nearly all the district head-quarters, where gratuitous medical aid can be obtained from qualified practitioners, and where proper appliances for setting fractures are kept in readiness. The people are beginning to seek relief regularly at these institutions.

Sanitation is backward in the village, although a certain amount of cleaning is done by the sweepers, who reside in the out-caste quarter, and receive the refuse food and clothes and at times some money payments for their services. Villagers are careless about the common water-supply, and they allow the wells and tanks to be contaminated unnecessarily. They think little of the ventilation of their houses; however, as they spend much of their time in the open air, sleep on the house-

tops, in open verandas, and in the fields, they are mostly healthy. But when an epidemic unluckily reaches the village, it claims many victims.

Law is placed in the hands of the Thakar, but the exercise of it is generally left to his kamdar or manager; however, there is an appeal to the state courts. Advocates are mostly villagers with natural loquacity, who take up the cases of their less forward neighbours for a consideration, and eventually gain a local reputation and a large practice if they have success. Qualified lawyers are still unknown to the villagers here; nevertheless, litigation is sometimes pursued to the last appeal, and the Queen-Empress is even petitioned when the Viceroy and other representatives fail to satisfy the importunate litigant. The people of these States are most persistent petitioners when they have an imaginary or real grievance, and many men of doubtful repute earn a good livelihood by petition-writing, and urging them on to the law courts. Even relations will often carry on litigation with each other till the family property has been wasted in law expenses, and the minor official is often accused by the villager. During the absence from home of two brothers their house was burned, probably accidentally, and considerable jewellery and property lost to the owners, who blamed the local officials for first plundering the house and then burning it, to divert suspicion from the burglars. Dissatisfied with the findings of the various courts in the case, the plaintiffs petitioned every authority up to the Viceroy, and finally sailed for England in the hope of having their wrongs redressed by the Queen-Empress. At that time the permanent political officer was on leave, and they calculated on his assisting them to approach her Majesty. On landing in London, they inquired for him of many, and asked to be directed to their Agent-sahib; but were much astonished and disappointed to find a man of such high standing in their own country unknown in the world's capital, either by his name or office. So

they returned disheartened to their own homes, determined to bear the wrongs and losses they had sustained rather than remain in a benighted city like London! They said to their friends: Great London is a "Bari Andher Nagrinen bilkul achhi nahin Agent sahibre waste keyannen puchhio pin unanen koinahin janen." London they considered a most dark and backward city, and not at all a good place. Fancy! they asked many people for the Agent-sahib, and nobody knew him, nor could any one direct them to him!

Village life is extremely simple; the occupations of the people are mostly outdoor and very healthy. Every member of the community falls into his place naturally, and there is not the same struggle for position and money which exists in large centres. Consequently, wear and tear of the system are at the minimum, and the average life is long. Besides, the villagers are more virtuous than their fellows in the crowded cities; their diet is simpler, their habits more regular, and they are remote from most epidemics, except smallpox, which is now being greatly subdued by vaccination. Only a few indulge in alcohol, so, if famine can be averted, and their water-supply somewhat improved to prevent cholera outbreaks, these people of the desert will have considerably more than the usual period of longevity, and they will steadily increase in numbers.

BOOKS OF REFERENCE

The following works have been referred to:—

"Annals and Antiquities of Rajasthan." Tod.
"Rajputana Gazetteer."
Gazetteers of Marwar, Mallani, and Jaisalmir.
Rajputana Administration Reports.
"Gazetteer of the East India Company," &c. Thornton.
"Hind Rajasthan." Mehta.
"Itihas Rajasthan (Hindi)." Ram Nath.
Marwar Administration Reports.
Famine Reports.
"Guide to Jodhpore."
"A Brief Account of Jodhpore." Sukhdeo Prashád.
Murray's "Birds of India."
Jerdon's "Birds of India."
Jerdon's "Mammals of India."
Butler's "Birds." Bombay.
Day's "Fishes." India.
Wood's "Insects."
"Forests Flora." Brandis.
Miss Macadam's "Trees and Plants of Abu, Jodhpore, and Jaisalmir."
"Indian Ferns." Baynes.

GLOSSARY

Achalgarh, temple.
Achleshwar, temple.
Ajodhya, city.

Baids, Hindoo physicians,
Bajra, species of millet.
Balmer, town.
Balsamand, lake or tank.
Bazaar, market.
Bhambi, coolie caste or menial caste.
Bhati, Rajpoot clan.
Bhurtpore, state and its capital.
Bund, dam.

Chhattri, monument.
Chohan, Rajpoot clan.
Chonda.

Daroga, superintendent.
Dassera, Hindoo festival.
Deesa, cantonment.
Dewan, prime minister.
Dholpore, state and its capital.
Dwarka, city to which pilgrims resort.

Gaddi, throne.
Gau mukh, a natural spring with temple, where pilgrims bathe. The water flows through a marble fountain in the shape of a cow's head.
Ghara, earthen vessel
Ghee, clarified butter.
Grasia, aboriginal tribe.
Gujerat.
Guru Sikhar, highest peak of Mount Abu.

Hindu, native of India following the Hindoo religien.

Ishwara, temple.

Jhalla, clan of Rajpoots.
Jodhpore, city and state of Mar war.
Jowar, millet, species of.

Kanauj, ancient city.
Kanode, *Khuni*, *Khurram*, *Kutch*, towns.
Kerari, town.
Kharif, crop.
Kharins, fertile valleys.
Khichi, Rajpoot clan.
Kotah, city.
Krishna, Hindoo deity.

Mahomedans, sect
Mallani, district.
Marothe, town.
Mogul, ex-Emperor of India.

Mussalmans, sect. See *Mahomedans*.

Nadole, town.
Nakhi, Abu lake.
Neemuch, cantonment.
Nochna.

Palanpur, town.
Parihar.
Parsi, sect.
Pawar.
Pohkaran, town.
Poona, town and cantonment.
Pramar, tribe of Rajpoots.
Prithvi Raj, chief.
Punjab.

Rabi, crop.
Rann of Kutch, delta of River Suni.
Rinn or salt marsh.
Rutlam, city and state.

Sannyasis.
Sardars, nobles, officers.
Satlaj, river.
Scindia, chief of Gwalior.
Shishodia, clan of Rajpoots.
Shri Krishna, deified hero.
Sindh, *province*.
Solankhi, tribe of Rajpoots.
Srimali, caste of Brahmins.
Subadar, officer.
Surajwansh, Sun race.

Tanot, town and district.
Tchsildar, civil district officer.
Thakar, baron or landholder under the chief.

Ulwar, state and city.
Umarkote, town.
Ummed Singh, chief.

INDEX

A.

Abbott Sagar, 122
Abu Sanitarium, 371
Agriculture in Jaisalmir, 28
—— in Marwar, 8
—— in Sirohi, 18
Amputations, 245
Anæmia and Debility, 225
Animals, Domestic, 189
Ant-eater, Scaly, 173
Antelope, 165
Arachnida, 392
Arboriculture, 406
Arteries, Operations on, 242
Artisans, Village, 439
Ass, 190

B.

Badger, 171
Bali, Description of, 295
Balmer, Description of, 293
Balsamand, 104
Bania, the Village, 436
Baoris and Jhálras (Large Wells) in Jodhpore, 121
Bats, Varieties of, 173
Bear, Black, 170
Bees, 386
Bekra (Four-Horned Antelope), 166
Bhatis of Jaisalmir, 69
Bhatki, Description of, 295
Big Game, 168
Bilara, Description of, 291
Birds, Wild, 352
Birth-Rate of Jaisalmir, 204
—— of Jodhpore, 202
—— of Sirohi, 204
Biscobra, 174
Bittern, 179
Black Buck, 165
Boar, Wild, 163
Bones and Joints, Operations on, 244
Brahmins, Village, 440
Breast, Operations on, 244
British Institutions in Marwar State, 298
Buffaloes, 191
Bustards, 177, 182
Butterflies, 391

C.

Camels, 192
Capital of Jaisalmir, 87
—— of Jodhpore, 75
—— of Sirohi, 86
Cataract, Operations for, 241
Cat, Domestic, 193
Cats, Wild, 170
Cattle, 190
Chiefs of Jaisalmir, 69
—— of Marwar, 42

Chiefs of Sirohi, 61
Chigoe ("Jigger"), 383
Chikara (Indian Gazelle), 165
Chirianathji, the Ascetic who brought drought on Marwar, 99
Chital, 166
Cholera, 213
Circulatory Diseases, 228
Climate of Abu, 32
—— of Jaisalmir, 25
—— of Marwar, 10
—— of Sirohi, 14
—— and Europeans, 197
Cobras, 174
Cochineal Insect, 385
College, Mayo, Ajmere, 433
Crane, Varieties of, 183
Crocodiles, 174
Crops and Soils (see Agriculture and Parganas)
Crustacea, 188
Currencies and Mints, 111

D.

Dead, Disposal of, 154
Debility and Anæmia, 225
Desuri, Description of, 297
Dewan Salem Singh of Jaisalmir, 71
Diarrhœa, 229
Didwana, Description of, 286
Digestive Organs, Operations on, 242
—— System, Diseases of, 229
Diptera, 385
Diseases, 207
—— General, 227
—— Medical, 210
—— Surgical, 240
Dispensaries and Hospitals, Jodhpore, 260
—— in Jaisalmir, 265
—— in Sirohi, 264
Dispensary Towns, 283
Dog, Domestic, 193
—— Wild, 170
Drainage, 124
Droughts and Floods in Sirohi, 15
Duck, 179
—— Winter Visitants, 180
Dysentery, 218
Dyspepsia, 230

E.

Ear Diseases, 227
Earthquakes in Abu, 35
Elephant, 193
Epidemics, 251
—— in Abu, 36
Events of Bairi Sal's Reign, 72
—— of Jaswant Singh's Reign, 54
—— of Kesri Singh's Reign, 66
Exports and Imports, Marwar, 9
—— and Imports, Sirohi, 18
Eyeball, Operations on, 241
Eye Diseases, 227

F.

Fairs, Principal, in Abu, 38
—— in Jaisalmir, 140
—— in Marwar, 137
—— in Sirohi, 139
Famines, History of, 143
Feathered Game, 177
Ferns and Flowers, 423
Filaria medinensis, 394
—— sanguinis hominis, 394
Fishes, 185

Flies, 385
Floods and Droughts in Sirohi, 15
Flora and Forests, 397
Florican, 183
Flowers and Ferns, 423
Flukes, Liver, 395
Food, Cooking of, &c., 199
Food and Markets, 156
Food-grains, Prices of, 160
Forests and Flora, 397
Fort of Jaisalmir, 89
—— of Jodhpore, 80
Fox, 170
Frogs, 174
Fruit, 427
Fuller's Earth, 5

G.

Game, 163
—— Big, 168
—— Cock, 195
—— Feathered, 177
Gazelle, Indian, 165
Geese, 179
Genealogy of Jaisalmir Rulers, 73
—— of Marwar Rulers, 60
—— of Sirohi Rulers, 68
General Diseases, 227
Geology of Marwar, 3
Goats, 192
Goitre, 230
Grains, Food, Prices of, 160
Grant, J. W., Captain, I.M.S., 238
Grasses, Fertile Lands, List of, 404
—— Fertile Lands, Description of, 416
—— Desert, List of, 406
—— Desert, Description of, 421
Grey Partridge, 195
Guinea-Worm, 394, 225
Gusainji, 101

H.

Hare, Indian, 167
Head and Face, Operations on, 242
Health, Preservation of, 196
Hedgehog, 167
Helminthology, 393
Hemiptera, 384
Hernia, 243
Hewson Hospital, Jodhpore, 260
Hill Diarrhœa, 239
Home, Mr., 8, 82, 104, 105, 291
Horse, 189
Hospitals and Dispensaries, Jodhpore, 260
Hyæna, 170
Hymenoptera, 386

I.

Imperial Service Troops, 109
Imports and Exports, Marwar, 10
—— Sirohi, 18
Industries in Marwar, 9
Influenza, 218
Injuries, Local and General, 247
Insanes in Jaisalmir, 309
—— in Jodhpore, 307
—— in Sirohi, 308
Insects, 373
Itch Mite, 384

J.

Jackal, 170
Jails in Jaisalmir, 305
—— in Jodhpore, 301
—— in Sirohi, 304

Jaisalmir, General Character of the Country and the Soil, 26
—— General Description of, 21
—— History of, 69
—— Maharawal of, 72
Jalore, Description of, 289
Jasole, Description of, 284
Jaswant College, 57, 59
—— Hospital for Women, 262
Jaswant Singh I., Maharaja, 46
—— Singh II., Maharaja, 52
Jaswantpura, Description of, 292
Jodhpore City, Description of, 75
Joints and Bones, Operations on, 244
Jungle Fowl, 178

K.

Kailana, 103
Kamdar or Thakar's Agent, 434
Kanauj, 42
Kraits, 174

L.

Lac Insect, 388
Lakes in Abu, 31
—— in Jaisalmir, 27
—— in Marwar, 3
—— in Sirohi, 17
Law, Village, 444
Leopard Hunting, 170
Leprosy, 226
Lighting, 125
Lion, 168
Lithotomy and Litholapaxy, 243
Liver, Diseases of, 230
Lizards, 174
Loch, St., Colonel, 54
Locusts, 375
Lung Diseases, 228
Luni River, 3
Lymphatic System, Diseases of, 230
Lynx, 170

M.

Maharaja of Jodhpore, 54, 59
Malaria, Prevention of, 221
Malarial Fevers, 218
Mallinathji, 101
Mandore, Ancient Capital of the Rathores, 100
Markets and Food in Jaisalmir, 159
—— in Jodhpore, 156
—— in Sirohi, 158
Marwar, History of, 42
—— General Description of, 1
Mayo College, Ajmere, 108, 433
Meat, Cooking of, 199
Medical Aid, 254
—— Aspects of Jaisalmir, 27
—— Aspects of Marwar, 11
—— Aspects of Sirohi, 15
—— Diseases, 210
—— Institutions in Abu, 39
—— Practitioners, Native, 254
—— Remedies, Native, 256
Merta, Description of, 287
Meteorology, 310
Microbes and Disease, 395
Military Station, Abu, 36
Milk, Boiling of, and Precautions, 190, 191
Minerals in Jaisalmir, 24
—— in Marwar, 4
—— in Sirohi, 17
Mints and Currencies, 111
Mission Hospital, Jodhpore, 263
Monkeys, 194
Month, Health of each, 248

Morar, Dan Viavi Raj, 6
Mortality and Sickness of each Month, 248
Moths, 392
Mount Abu, 30
Multani Mitti, 5
Mungoos, 170
Mycetoma, 245

N.

Nagore, Description of, 285
Nawa, Description of, 291
Nervous Diseases, 227
Neuroptera, 387
Nilgai, 166

O.

Obstetric Operations, 244
Omens, 91
Otter, 171

P.

Pali, Description of, 283
—— Plague, 230
Panther, 169
Parasites, Vegetable, 395
Parganas of States, 130
Partridge, 177
Peacock, 194
Phalodi, Description of, 294
Physical Aspects of Marwar, 3
Pigeon, Blue Rock, 194
Plague, 230
Plovers, 184
Pohkaran, Description of, 288
Poisoning, 246
Population of Jaisalmir, 28
—— of Marwar, 5
—— of Sirohi, 18
Porcupine, 167
Poultry, 194
Pratap Singh, Sir, G.C.S.I., 53, 54, 55
Proverbs, Marwari, 96
Public Instruction in Jaisalmir, 116
—— in Marwar, 114
—— in Sirohi, 115
Python, 175

Q.

Quail, 183
—— Grey, 195

R.

Railway, Jodhpore-Bikanir, 126
Rainfall of Abu, 32
—— of Jaisalmir, 25
—— of Marwar, 10
—— of Sirohi, 15
Rathores of Marwar, History of, 42
Rats, Varieties of, 173
Recreation, 107
—— Abu, 38
Religions, 91
Remedies, Native Medical, 256
Residents, List of, W.R.S., 74
Residency Surgeons, List of, W.R.S., 265
Respiratory Organs, Operations on, 242
—— System, Diseases of, 228
Rheumatic Affections, 225
Rivers in Jaisalmir, 27
—— in Marwar, 3
—— in Sirohi, 16
Roads, Abu, 38
—— Jaisalmir, 128
—— Marwar, 126
—— Sirohi, 128

Round Worms, 393
Rulers of Jaisalmir, 69
—— of Marwar, 42
—— of Sirohi, 61

S.

Salt, Manufacture of, 4
Samber, 166
Sambhar Lake, 3
Sand-Grouse, 177
—— Imperial, 182
Sands, 40
Sanitation in Abu, 35
—— in Jodhpore, 277
—— in Sirohi and Jaisalmir, 282
Sardarsingh, Maharaja, 53, 59
Scorpions, 176
Scurvy, 224
Sheep, 192
Sheoganj, Description of, 299
Shergarh, Description of, 297
Shrubs and Trees, Fertile Lands, List of, 397
—— Desert, List of, 404
Siaji, 42
Sickness and Mortality of each month, 248
Sights worth Seeing, 98
Sir Pratap Singh, G.C.S.I., 53, 54, 55
—— Impressions of England, 58
Sirohi, General Description of, 13
—— History of, 61
—— Maharao of, 65
Skin Affections, 247
—— Operations on, 246
Slaughter-Houses, 129
Smallpox, 210
Snakes, 174
Snake-bite, Treatment of, 175
Snipe, 181
Soils of Jaisalmir, 24
Sojat, Description of, 296
Spiders, 392
Spleen, Diseases of, 230
Squirrel, 173
States, Divisions into Parganas, 130
Suhdeo Persad Pundit, R.B., 380
Sumer Singh, Maharaj Kunwar, Birth of, 59
Superstitions, 91
Surgical Diseases, 240
Sursagar, 104
Swine, 193

T.

Tanks in Abu, 31
—— in Jaisalmir, 122
—— in Jodhpore, 118
—— in Sirohi, 122
Tape-Worms, 393
Teal, 181
Tebas, 4
Tehsils of Sirohi, 133
Temples and Shrines, Abu, 37
—— in Jodhpore, 98
Termites, 387
Thakar-Sahib, 431
Thread-worms, 393
Tiger, 168
Tramways, 127
Trees and Shrubs, Fertile Lands, List of, 398
—— Description of, 406
—— Desert, List of, 404
—— Desert, Description of, 417
Trematoda, 395

Trichina spiralis, 394
Tubercular Diseases, 226
Tumours, 241

U.

Urinary Organs, Operations on, 243

V.

Vaccination in Jaisalmir, 273
—— in Marwar, 266
—— in Sirohi, 271
—— General Remarks on, 275
Vegetable Parasites, 395
Vegetables, 426
Venereal Diseases, 224
Village and Villager, Description of, 429
Vipers, 174

W.

Water, Analysis of Balsamand, 119
—— Purity of, 396
—— Scarcity of, in Jaisalmir, 23
Water-Supply of Abu, 35
—— of Jaisalmir, 122
—— of Jodhpore, 117
—— of Sirohi, 122
Wells in Jaisalmir, 123
—— in Jodhpore, 120
—— in Sirohi, 122
White Ants, 387
Wolf, 170
Worms, 225
—— Intestinal, 393
Wounds by Wild Animals, 171
—— Care of, 172

THE END

Printed by Ballantyne, Hanson & Co.
Edinburgh & London

UNIVERSITY OF CALIFORNIA LIBRARY
Los Angeles

This book is DUE on the last date stamped below.

REC'D LD-URL
FEB 23 1983
FEB 2 1983

INTERLIBRARY LOANS
APR 1 1985
Due Two Weeks From Date of Receipt
GEORGETOWN U.

REC'D LD-URL
MAY 13 1985

REC'D LD-URL
MAY 11 1987

41584

3 1158 00850 3509

UC SOUTHERN REGIONAL LIBRARY FACIL

AA 001 135 648 2